INAUGURAL ADDRESS

ON

THE APPLICATION OF CLASSICAL AND SCIENTIFIC EDUCATION TO THEOLOGY;

AND

ON THE EVIDENCES OF NATURAL AND REVEALED RELIGION.

DELIVERED AS INTRODUCTORY TO A COURSE OF THEOLOGICAL LECTURES FOR THE USE OF THE PUPILS OF BRISTOL COLLEGE, BEING MEMBERS OF THE ESTABLISHED CHURCH.

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VISITOR OF THE COLLEGE.

Ἐμπρεπὲς γὰρ τοῖς ἑταιρίαν πρὸς Ἐπιστήμην θεμένοις ἐφίεσθαι μὲν τὸ ΤΟΝ ἰδεῖν· εἰ δὲ μὴ δύναιντο, τὴν γοῦν Εἰκόνα αὐτοῦ τὸν ἱερώτατον Λόγον, μεθ' ὃν καὶ τὸ ἐν αἰσθητοῖς τελειότατον ἔργον τόνδε τὸν κόσμον.

Philo-Judæus, Ed. Mangeii, tom. i. p. 419.

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PREFACE.

It seems desirable to premise to the following Address some account of the occasion on which it was delivered, and of the nature of the Establishment with which it is connected.

The vast increase of that superior portion of the middle classes of society, which the general diffusion of intellectual cultivation has now brought within its full operation, and has naturally inspired with the desire to impart to their offspring all the advantages of a superior education, evidently requires in the present age a considerable extension of the means of affording such an education. Our elder Universities, indeed admirable as they are in themselves, and justly as they must ever claim from the younger institutions, which may strive at a humble distance to follow their bright examples, a filial reverence and regard *, are yet, from the necessary limitation of their numbers, from their local circumstances, and from the conditions of expense which the general concourse of the first youth of the country can hardly fail to impose (even under any system of discipline) upon such establishments, restricted in great measure to the higher and wealthier classes exclusively; far beyond which, the actual demand for similar advantages of education now appears to be diffused,—a demand which can only effectually be met by the multiplication of establishments for such an education throughout those larger cities which constitute the metropolitan centres of extensive districts, and which may thus by local circumstances, and by an organization

* These younger institutions, deriving as they must from such almæ matres, their most efficient instructors, and the soundest models of discipline, must ever be ready gratefully to apply to them the language adopted as a motto by one of them, "Hinc lucem et pocula sacra."

especially directed to this object, more readily, more widely, and more cheaply, extend the advantages they offer.

Bristol, the natural metropolis of our south-western counties, and long the second city of our empire, presents a local point which cannot but appear highly favourable for undertaking such an establishment: and with such views has BRISTOL COLLEGE been instituted; and its founders have been encouraged by auspices derived from many local recollections. Grocinus, the distinguished friend of Erasmus, the earnest explorer of the classical stores of Italy, at the period of the revival of learning, and himself one of the first restorers of Grecian literature in this country, was a CITIZEN OF BRISTOL. In Poetry this city claims the memory of Chatterton, and the living fame of Southey; in Painting she boasts of her Lawrence and Bird; and in Sculpture, of the surviving talents of Baily: as to Science, it may be mentioned that it was here that the then young Davy commenced his chemical career as the assistant of Beddoes. To develope such minds, and to increase their opportunities of finding appropriate cultivation, is the great object and the fond hope of such institutions as the College recently founded.

This College has been established by the joint subscriptions of a proprietary body. It has been placed under the superintendence of a Principal and Vice Principal, who are Graduates of the University of Cambridge; Dr. Jerrard, late Classical Tutor of Caius College, and Mr. Butterton, Fellow of St. John's. The College was only opened on the 17th January, 1831: but it may be satisfactory to subjoin a short statement of the course of instruction intended to be pursued, and even at this early period very efficiently entered upon.

In Classics, the same Authors are read, and with the same critical accuracy, as at the Universities of Oxford and Cambridge. Sophocles and Euripides, Thucydides, Demosthenes and Xenophon, Tacitus, Cicero, Juvenal, Horace, and Virgil's Georgics, have been hitherto the

subjects of regular lectures. Æschylus, Aristophanes and Plato have also been read. Much attention is given to composition in Greek, Latin and English, as also to History and General Literature.

In Mathematics, the Students have hitherto been chiefly occupied with Euclid and Bourdon's Algebra. The Integral and Differential Calculus and Mechanics have however been already lectured in at the College. [This course is to be extended to the *Mécanique Analytique* of Lagrange, and the *Mécanique Celeste* of Laplace. The most important parts of Newton's *Principia* will also be read.]

In Metaphysics, the text-book is Locke, and reference is made to all the most eminent British metaphysicians. The subject of the Grecian Logic is occasionally introduced. [*In Ethics*, besides Paley's Moral Philosophy, it is intended, in order to pursue the connection of this science with Theology, to adopt Butler's Analogy as a standard work.]

Professors of *French*, *German* and *Italian*, have been appointed. In the first of these languages a large Class has already been formed.

The Lectures on the Greek Testament consist chiefly of critical explanations of the text, and of such illustrations of it as are afforded by the works of Michaelis, Lardner, Schleusner, and Paley (whose Evidences and Horæ Paulinæ are much used).

Every morning before the commencement of Lectures the Students are all assembled to hear a portion of the Scriptures read by the Principal.

Such is a sketch of what is actually done at the Bristol College within little more than four months after its opening. It is expected that arrangements will shortly be made for Lectures in the Oriental Languages, as also in Geology, Chemistry, and other branches of science.

In order to complete their plan, the Council have resolved to establish a Junior department of the Bristol College. This is to open on the 1st of September next, under the direction of J. Price, M.A., of St. John's College Cambridge.

With reference to the more immediate occasion of the course of Theological Lectures, to which the following Inaugural Address forms the introduction, it is only necessary to observe, that as it was desired to place the Institution on the most extensively useful and liberal basis, impartial admission to all the advantages it offers is conceded without distinction to the members of different religious communities. At the same time, a large portion of the Council (being members of the Established Church) have felt it their duty in no manner to neglect the providing sufficient means for the religious instruction of the Pupils belonging to the same in the tenets of that Church. To this effect the Seventh Article of the general constitution of the College declares "That the Institution shall be open to Students of all religious denominations without preference or distinction; but that it shall be competent to a committee, consisting of those members of the Council who are also members of the Church of England, to institute lectures and provide instruction in Theology, under such regulations as they shall determine on*." To carry the latter part of this Article into effect, a special committtee has been accordingly organized, and has adopted the following Resolutions.

"At a Meeting of Proprietors of the Bristol College, assembled on Thursday, the 10th of December, 1829, in the Lecture Room of the Philosophical Institution, to take into consideration the commencement of a Fund for the Endowment of the Theological Lecture at the College, and for carrying into effect the Seventh Regulation of that Establishment; J. C. Prichard, M.D., F.R.S., in the Chair; the Seventh Regulation, passed at the establishment of the Bristol College, on the 26th November, 1829, having been read, the following Resolutions were unanimously adopted:—

"Moved by W. P. Taunton, Esq., and seconded by C.

* The appointment of a Lecturer for this purpose, and the responsibility for any expenses which may be incurred, of course devolve exclusively on the special committee appointed with reference to this object.

George, Esq.;—That a Subscription be immediately opened for the commencement of a Fund in aid of the endowment of a Theological Lecture at the Bristol College, and for carrying into effect the Seventh Regulation of that Institution.

"Moved by J. C. Swayne, Esq., and seconded by E. B. Fripp, Esq.;—That the Fund, consisting of Donations and Annual Subscriptions, be placed under the management of a Committee of Members of the Church of England, appointed by the Seventh College Regulation.

"Moved by Mr. John Taylor, and seconded by James Gibbs, Esq.;—That Christopher George, Esq., be appointed Treasurer of the Fund, and that he be required to make a report annually of the state thereof to the Committee,—a copy of which shall be sent to every Donor and Subscriber thereto.

"Moved by R. Poole King, Esq., and seconded by F. Ricketts, Esq.;—That a Copy of the Proceedings of this Meeting be sent to every Proprietor of the College, and that they be respectfully requested to patronize the Lecture Fund.

"J. C. PRICHARD, Chairman."

"*College Chambers*, 19 *St. Augustine's-Place*, *Bristol, January* 29, 1830.

"At a Meeting of the Theological Lecture Committee, Dr. Prichard in the Chair; It was unanimously Resolved, That the Course of Theological Instruction be conducted according to the following outline:—

"1.—The evidence and doctrine of natural religion, as deduced by inference from the works of nature, from the phænomena of the human mind, and from the circumstances of mankind. The text-books of this part of the course may be the works of Derham and Paley on Natural Theology, and the Analogy of Bishop Butler.

"2.—The evidences of Christianity; taking as text-books the works of Paley, Chalmers, and Less, on this subject.

"3.—A brief survey of biblical criticism, upon the basis of the lectures and translations of Bishop Marsh, or at least the second volume of the Introduction to the Critical Study of the Scriptures by the Rev. Hartwell Horne.

"4.—Scriptural Archæology, with Sacred and Ecclesiastical History.

"5.—The doctrines of the Church of England.

"6.—The most important principles relative to Church Discipline.

" The course, or any of the sections, will be open to all Students who may feel disposed to attend; and examinations on the subject of each section will take place periodically.—The fees of admission will be hereafter determined upon."

The following Volume presents the first effects of the above Resolutions, as constituting the introduction to a course of Theological Lectures, intended to be delivered in accordance with the principles thus laid down.

The author feels that he cannot conclude the present statement by any more appropriate or satisfactory illustration of the feelings which have generally animated the founders of this Establishment, than that which is afforded by the following speech, pronounced by his esteemed friend Dr. Carrick, on the Opening of the College, Jan. 17th, 1831.

" Gentlemen of the Council,—You are met together, this day, on an auspicious and memorable occasion, the inauguration of the Bristol College, of which you are the guardians and founders. This day, Gentlemen, will be held in grateful remembrance by distant generations: for institutions like this, which have public utility alone for their object, are destined to defy the waste of time, and to survive the convulsions of empires. The learned and the good of centuries to come will refer to the act of this day with a thankful recollection of the benefits you will have bestowed on them, and on their children; for of all the benefits which can be conferred on posterity, education is the greatest,—being the grand inlet of knowledge; the instrument by which the most valuable attainments are acquired.

" It has long, Gentlemen, been the subject of wonder and regret, that in this glorious country of England, so highly favoured by Providence, with more ample means of diffusing education than are possessed by any other nation, so little in that department should have been done; for down to the present time, a want of attention to that important object has been manifested by the Legislature, which it is not less difficult to account for than to excuse. We have indeed two national seminaries which stand unrivalled in the universe, for the splendour of their endowments and their literary renown: which afford opportunities for the cultivation of ornamental and useful learning, and possess too, the means of

fostering and rewarding genius, beyond all comparison with any similar establishment under the sun. Yet however well adapted these great seminaries may have been for their original purposes; however suitable for a state of society and times long gone by; however ample may still be their stores, —they are evidently inadequate to the wants of the present day; for the wants of a population four times more numerous, and twenty times more rich, and more generally anxious for a good and liberal education; an education useful and practical as well as ornamental; education brought home to their doors, and which can be obtained at a moderate cost; and without that imminent risk, which young men must necessarily run, of falling into evil habits, when turned out into the wide world of Oxford or Cambridge, their own masters, at the dangerous age between boy and man.

"Independently of every other consideration, there ought, in this great kingdom, to be at least a dozen Oxfords, in order to supply the means of education commensurate with the wants of the community. In almost all other countries, especially Protestant countries, although vastly inferior in wealth and numbers to this, universities and public seminaries for literary and general education are everywhere thickly planted. In Italy, the lamp of Science can scarcely be said to have been ever wholly extinguished since the classic days of Greece and Rome. There, universities of name are found in almost every city and every town. Next to Italy, France was perhaps the eldest child of Science, as well as of the Church. Germany, Holland, and Switzerland, became distinguished in more recent times, in this illustrious race of knowledge. Even the Scandinavian kingdoms, in spite of their sterile soil and frost-bound climate, may justly boast of their universities and their learned men. Our own Scotland too, although neither rich nor populous, has long been celebrated in this honourable rivalship; comprehending within its narrow limits not less than four universities of ancient foundation; all of which can reckon amongst their members names of high renown, in every department of science and literature. In addition to these, and to the usual provision of grammar-schools of good reputation, Scotland possesses various public establishments, there called Academies, where every thing but classical learning is taught; where the useful, rather than the ornamental, parts of education are more particularly attended to, and where young men are fitted for

almost every department of real life. But beyond all these, the proud boast of Scotland is its parochial schools: not one parish throughout the kingdom being without its national school, and its schoolmaster: as regularly constituted and endowed as the living and the clerical incumbent. The influence of such an arrangement on the morals, the manners, the habits, the general intelligence, and the religious character of the people, may be easily imagined. That education does not in every case prevent immorality, crime, and wickedness, is a truth to be lamented: but its preventive influence is confessedly great; of which the recent trials under the special commissions afforded a striking example, in the vast proportion of criminals who could not read nor write.

"The infant and ambitious states of America were not slow in discovering this all-powerful lever of education, so necessary to lift them to that universal empire in every thing to which they fondly and openly aspire. I remember when studying at Edinburgh the three or four years immediately following the conclusion of the American war, the university was crowded with American students (all intercourse with this country having for some time previously been interrupted), who, when they returned to their own country, became in various instances the efficient founders of colleges in their respective states; where medicine and all the branches of useful learning are now successfully taught. And although during these years, there were not fewer than twenty or thirty Americans annually, who took their degree of Doctor in Medicine; almost ever since, as soon as these gentlemen had brought their new institutions into action, you may look in vain for almost a single American in the long lists of Edinburgh graduates. I have mentioned these otherwise trivial circumstances, in order to show how rapidly institutions of this nature, founded in usefulness, and fostered by patriotism, grow up into maturity; and we may from hence feel confident, that the tree of knowledge which we have now planted in our own venerable city, with so many advantages both natural and moral in its favour, will prove still more vigorous in its growth, and abundant in its produce.

"With respect to its origin, the Bristol College is somewhat remarkable. The ancient seats of learning were, almost without exception, reared by the fiat of kings, princes, and potentates, or dignified churchmen, and nourished by the wealth and influence of an all-powerful clergy; while ours is

the result of the voluntary subscriptions of a few private individuals, unsupported by any thing but the merit and usefulness of the Institution itself.

"We had indeed one precedent, one bright example, in the formation of the London College, an establishment of which a nation may well be proud. Yet this great work, it must be owned, was effected under far more favourable auspices than ours; and when we consider the vast combination of aristocratic and commercial wealth and influence which conspired in the formation of the London College, directed as it was by the magic wand of the master spirit of the age, the now Lord Chancellor Brougham, whose universal talent and matchless industry place him far above all other men,—when these vast advantages in favour of the London College are considered, your efforts and achievement seem fairly superior in merit, although inferior in splendour.

"Notwithstanding, Gentlemen, the purity of your views, you have had some difficulties to struggle with in the outset, and you may have still some perhaps to overcome. But when I reflect on the unanimity and zeal which have been hitherto so eminently displayed by the founders and patrons of the Institution; when I reflect on its own intrinsic excellence; the enlightened and beneficent principles on which it is founded; embracing, as it does, all denominations of Christians in the common bond of charity and public usefulness; where Christianity is displayed as the true foundation of all useful instruction, but where the minor differences in opinion are merged in the single, the grand outline of Christianity itself; when I reflect on these things, I feel perfectly confident that the partial and temporary obstructions, or rather retardations of your progress, will be speedily surmounted, and that a signal victory will crown your labours. Your Institution has had to abide the common lot of all improvements,—misapprehension, distrust, and perhaps too a certain dash of jealousy, which peculiar circumstances might tend to palliate or excuse. But time will undeceive the unwary; a little sunshine will dissipate this morning cloud; and those who from misconception of your motives have withdrawn for a time their countenance, will feel anxious to return to you, when they see that their fears were groundless. It is a glorious conquest to convert an adversary into a friend.

"But however deeply we may regret the absence of certain venerable and highly respected individuals, whose counte-

nance and support we had reason to expect; your unaided exertions have, I am proud to say, been hitherto singularly successful. In little more than a year from the commencement of your labours, you have advanced to the consummation of your wishes. You have in that short space of time organized the various machinery of your Establishment; and you open it this day for its grand and ultimate purpose, the education of youth. Thus far you have been eminently fortunate in all your proceedings, and your good fortune has in no respect been more happily conspicuous, than in the acquisition you have made, of the justly distinguished Professors, who are about to carry into practice your beneficent intentions; under whose auspices and able direction, it is impossible to doubt of the success of the Bristol College.

"Before I conclude, I would beg to address a very few words to that portion of this company who are the peculiar and ultimate objects of our labours and solicitude,—the Students of the Bristol College.

"You are now, young Gentlemen, about to enter on a most important and critical portion of your lives; upon the proper or improper employment of which, your success and respectability in the world, your happiness both now and hereafter, will greatly depend.

"Let me intreat you to reflect, that life at best is but short; and that we cannot afford to suffer any part of it to run to waste. You must now lay in a stock of knowledge which may carry you through life, whatever your after-pursuits may be, with usefulness and honour. But recollect, this is not to be done without exertion, without the frequent sacrifice of momentary pleasure and gratification. Self-denial is a virtue of the highest quality; and he who has it not, and does not strive to acquire it, will never excel in any thing.

"Remember, Gentlemen, that all is the gift of industry. Without industry nothing valuable can be acquired; and by dint of industry every thing is at your command. Industry and perseverance, with moderate talents, will effect that which the greatest talents without industry can never accomplish.

"You must consider your advancement in learning as the chief and sole object of your ambition. Let your whole desire for the present, be the distinguishing yourselves in the various exercises through which that requisite stock of knowledge is to be acquired; and you will have ample time hereafter for the enjoyment of pleasure,—of that intellectual

pleasure which is pure and without alloy, and of which you can never be deprived. Knowledge, when once implanted in the mind, is imperishable; and it is the last of a man's property he would ever consent to part with, were it possible for it to be sold for a price. Riches, honour, power, and place, oft make themselves wings and fly away; but knowledge, the fruit of education, is a possession which no misfortune can divest you of, and which will place you in a great measure above the storms of fate. 'Felix qui potuit,' says one of the greatest poets, in one of the most beautiful distichs that was ever written; which, although often repeated, can never be too much admired:—

'Felix, qui potuit rerum cognoscere causas,
Atque metus omnes et inexorabile fatum
Subjecit pedibus, strepitumque Acherontis avari!'

"But above, and far beyond all other concerns, let me entreat you, my young friends, to be mindful of your religious duties. Remember your duty to your Maker; compared with which, all other duties or pursuits are but as dust in the balance.

"The fear of the Lord is the beginning of wisdom: and with that as a foundation, all other useful knowledge will be added unto you. I need not tell you that the foundation of all true religion is the Bible. With that sacred volume you must be still more familiar than with Cicero and Xenophon.

"Let no day pass without your reading, with serious and devout attention, a portion of the Sacred Scriptures; in which you will find treasures of surpassing value, and beauties in point of composition, which your classic models cannot equal. Those sublime effusions want no recommendation of man. Their own intrinsic excellence is sufficient to challenge the admiration, and to rivet the attention of all who read them. Yet I cannot resist the opportunity of presenting you with the opinion of a man, than whom there never perhaps existed one, who, from his admirable talents, and the extent and nature of his researches, was better qualified to form an opinion on this great subject. I allude to the late Sir William Jones: I may truly say, the great Sir William Jones. At the end of his Bible were written the following lines, which ought to be written in the hearts of us all:—

"'I have regularly and attentively read these Holy Scriptures; and am of opinion, that this volume contains, independently of its divine origin, more true sublimity, more exquisite beauty, purer morality, more important history, and

finer strains of poetry and eloquence, than could be collected within the same compass from all other books that were ever composed in any age, or in any idiom.

" ' The two parts of which the Scriptures consist, are connected by a chain of compositions, which bear no resemblance in form or style to any that can be produced from the stores of Grecian, Indian, Persian, or even Arabian learning. The antiquity of those compositions no man doubts; and the unrestrained application of them to events long subsequent to their publication, is a solid ground of belief that they are genuine productions, and consequently inspired.'

" I will not detain you longer, Gentlemen, but will now, in your name, commit the important trust of your infant and cherished Establishment to our respected Principal Dr. Jerrard, our Vice Principal Mr. Butterton, and the other Professors who are now before me; and will conclude with offering our warmest and heartfelt prayer to the Almighty Ruler of the universe, from whom alone success can flow, that he may be graciously pleased to take this great work under his special protection, and cause his divine blessing to rest upon our humble endeavours."

The sentiments so justly expressed by Dr. Carrick on the duty of regarding religion as the great ultimate aim of intellectual exertions, lead the writer of this Preface to subjoin, as a further illustration of this important subject, a most beautiful prayer of the illustrious Bacon, composed expressly with reference to the purposes of a Student invoking the Divine assistance and guidance of his mental pursuits. It is most gratifying to find this truly master-mind, the great opener of the paths of effective science, thus pouring out the aspirations of his soul to its God :—

" Ad Deum Patrem, Deum Verbum, Deum Spiritum, preces fundimus humillimas et ardentissimas, ut humani generis ærumnarum memores, et peregrinationis istius vitæ nostræ, in qua dies paucos et malos terimus; nova adhuc refrigeria e fontibus bonitatis suæ ad miserias nostras leniendas aperiant; atque illud insuper, ne humana divinis officiant, neve, ex reseratione viarum sensus, et accensione majore luminis naturalis aliquid incredulitatis et noctis animis nostris erga divina mysteria oboriatur : sed potius ut ab intellectu a phantasiis et vanitate puro et repurgato, et divinis oraculis prorsus deditio, fidei dentur quæ fidei sunt."

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INAUGURAL ADDRESS.

PART I.

ON THE RIGHT APPLICATION OF CLASSICAL AND SCIENTIFIC EDUCATION TO THE PURPOSES OF THEOLOGICAL INSTRUCTION.

IT is altogether impossible that I should for the first time address the members and friends of such an Institution as that before me, on such an occasion as the present, without feelings of the highest gratification: every patriotic sentiment must lead me to rejoice generally in the rise of Institutions calculated to promote the best interests of society by the diffusion of the superior branches of useful knowledge, and the extension of the opportunities of a well regulated education. Of these Institutions indeed we may confidently anticipate the success, inasmuch as they are not the feeble creations of any visionary projects, but called into existence as absolutely required by the necessities and demands arising from the actual state of society; and thus originate from circumstances of demand precisely similar to those which, in that marked though partial outburst of literary

aspiration which distinguished the twelfth and thirteenth centuries (an æra which may justly dispute with the fifteenth the honourable title of that of the revival of learning), crowded with eager pupils the popular lectures of Abelard at Paris, of the Croyland monks at Cambridge, and of Vacarius* at Oxford,—and thus appear to have laid the foundations of those celebrated Universities, if we endeavour to disentangle their authentic history from the mass of fabulous matter beneath which it hath been obscured. Far from us be any pretensions of rivalry to those venerable and illustrious establishments: but we may surely, without presumption, draw from the analogy I have pointed out, the hope that our Institution will also be found among those which, to borrow the words of a philosophical historian, "Society by a sort of elective attraction seems to select from among the many objects presented to it, as having an affinity

* It has been indeed often asserted, that Alfred restored the schools of Oxford, which according to this account had an earlier Britannic celebrity. A passage in Parker's edition of the contemporary biography of Alfred, by Asser, affords the foundation of this assertion: but the most recent critical examinations have left no doubt of the interpolation of the passage in question, as will be rendered fully evident whenever the anxiously expected critical edition of the early monuments of our history, now preparing under the superintendance of Mr. Petrie, shall see the light. The archæology of our Universities at one period particularly engaged my attention; and I have never found any claim to an antiquity earlier than the close of the twelfth century, which would bear the test of critical examination. The Chronicle of Ingulph of Croyland, indeed, appears to allude to the schools of Oxford in the time of Edward the Confessor; but an able writer in the Quarterly Review for June 1826, has sufficiently exposed the spuriousness of this composition.

with it, and easily combining with it, in its state at the time*."

But if such considerations lead me generally to rejoice in the rise of similar Institutions,—in that established in *this City* I cannot but feel peculiar interest. The memory of many gratifying friendships here formed, of much cordial kindness here experienced, during the years of my residence in the neighbourhood,—must engage all my warmest feelings in favour of objects which appear so well calculated to advance the intellectual character of this important city.

But above all, I have (as I have said) peculiar gratification in addressing you on the present occasion; because the purpose for which we are now assembled proves, that while we are properly engaged in cultivating the noblest faculties which the Father of all Lights has bestowed on the creatures whom his all-wise and all-bountiful Providence hath made partakers of the most excellent gift of reason,—no culpable neglect has been suffered to render our designs imperfect in that which properly considered ought to form their great final aim; the directing that reason towards its highest object, the knowledge of its Divine Author; the object for which, as the great apostle forcibly reminded the most intellectual people of antiquity, "God created of one blood all nations of men to dwell on all the face of the earth,—determining the times before appointed, and the bounds of their habitation, that they should seek the Lord if haply they might feel after him and

* Mackintosh's History of England, vol. i. p. 246.

find him." As connected with your classical studies I may indeed remind you, that the most illustrious philosopher of the people thus addressed, while under the light of natural reason alone, and even when most warmly urging the necessity of separating the great principles of religion, which He, who hath never left himself entirely without a witness in the minds of his creatures, hath implanted in that reason, from the absurd and impure mixture of mythological fable:—I may, I say, remind you, that this leading philosopher most earnestly inculcated the necessity of making these religious principles the very basis of every sound system of education, which could qualify its pupils for properly discharging any of the political obligations of civil society. And I may cite an interesting example of the manner in which these dictates of a sound philosophy became heightened by the influence of Revelation, from a distinguished writer of Alexandria, who, to an intimate acquaintance with the speculations of the philosopher just quoted, added the faith which he inherited from Abraham, to whose race he belonged: I mean Philo Judæus, a contemporary of our Blessed Lord, from the pure source of whose doctrines I cannot resist the persuasion (so obviously suggested by his language) he had also drunk. This writer has the following passage, of which the very words seem expressly and remarkably applicable to Institutions like the present.

"It is proper for persons who form themselves into a Society for the advancement of knowledge, to long to behold the Supreme Being; and, since he cannot be discerned, his image the most sa-

cred Word [by whom he has revealed himself to us], and, in due subordination to him, the most perfect work of objects of sense, this universe." —*Philo Judæus*, lib. ix.

And thus may our endeavours to advance the noble cause of intellectual instruction, and to afford to the rational powers of our pupils a scientific and literary cultivation adequate to their full developement, be exalted, and, if I may so speak, sanctified, by our including in our aims, the acquisition of that higher and heavenly knowledge to which, assuredly, every rightly understood system of the education of immortal beings ought to be rendered subservient. There is, indeed, a natural analogy between the state of moral and preparatory discipline under which mortals are placed in this probationary scene as introductory to a future stage of being, and the *education* which prepares the youth for the purposes of the man. Ought we then ever to suffer this, our preliminary stage of instruction, to be destitute of all direction to the great ultimate end of our being? This surely must, to right reason, ever appear its highest as well as holiest object.

There is a strict accordance also between the most important subjects of instruction to which our establishment can be devoted, and their application to the great truths of religion: for if we turn to Natural Science, or Classical Literature,—who can read aright the great volume of Nature, without pausing at every page to admire with the full devotion of every faculty the splendid and countless proofs of design; the myriad combinations, each regulated by consummate wisdom and directed

by infinite benevolence, which they every where exhibit? Insensible must that mind be, and incapable of every high and expansive thought, which can intelligently survey these works of creation, and not be led to adore Him, " whose goodness beyond thought and power divine" all these proclaim. But I have advisedly used the phrase, " intelligently survey;" for although these glorious works speak plainly to all, even to the uneducated; though there be no tongue nor language whither their voice hath not gone forth,—yet undoubtedly much of the irresistible force of the inferences to be derived from them must be comparatively lost to minds which have not been opened by Scientific Instruction. Again, as to Classical Literature; what more interesting field of inquiry does it present to us, than that important chapter in the history of the human mind—the philosophical speculations of the various schools of antiquity? But where, also, can we better discover the natural aspirations and requisitions of that mind, its wants and its weakness, and the hopeless obscurity on the most important points of the best reason, until assisted by revelation, than where we see the most splendid examples of that reason,—thus finding no end, " in wandering mazes lost." For even when we find them laying down as the very fundamental principle of their systems, the existence of a Divine Mind, and justly reprobating the fictions of the vulgar and poetical mythology as palpably false and unworthy of the gods,—and cannot therefore suppose for a moment that they placed any faith in these gross absurdities; still less will the accurate ob-

server find any proofs that they entertained those pure and just conceptions of the Deity, or of that hope full of immortality, so earnestly sought after by the soul, which (however the enemies of Christianity may pretend that they, in common with ourselves, derived from the light of nature), it is certain that Revelation alone has developed to the understanding of man. Those scholars who have most critically and minutely examined the various doctrines of these philosophical sects, are the most fully aware of this deficiency*. It may be reckoned, indeed, as one of the most striking instances of the insufficiency of mere human reason, that often, when they appear in the writings they have left us to come the nearest to that knowledge, then the light which has guided them to the confines of truth suddenly quits them, and they are again lost in darkness, a darkness which could only be illumined by the bright sun of that Revelation.

The necessity of such a revelation, indeed, the ablest among them seem clearly to have admitted; candidly acknowledging their consciousness of the infirmity and insufficiency of human reason. There is a remarkable passage to this effect in Plato's report of the interesting discourse of Socrates on the Immortality of the Soul. One of the interlocutors is made to observe,—that since on a sub-

* On the subject of the imperfect views concerning the Deity, entertained by the ancient philosophical sects, I would especially refer to that most able and elaborate investigation of them, Meiner's very interesting tract "De Vero Deo." A full account of their real tenets, as to a future state, may be found in Warburton's Divine Legation of Moses.

ject of such moment so much doubt prevailed, our utmost efforts should be directed to the investigation and discovery of truth; but that since success in this seemed impossible, we could only select the most plausible of human opinions, and embarking in these as in a vessel, thus navigate amid the perils of life—"Unless, indeed," (mark this especially,) "any one might be enabled to proceed with less liability to failure and danger, as in a more secure vehicle, *by means of some divine communication.*" (Platonis Phædo. ed. Serr. i. p. 85). Perhaps a still more striking instance of the same kind occurs at the conclusion of the Dialogue on Prayer. In the course of this, Socrates has been introduced expatiating, with much justice of sentiment, on the truth afterwards briefly enounced by an Apostle, "that we know not what to pray for as we ought;" and he winds up his statement in such a manner as to show how strongly he felt the necessity of what the same authority was commissioned to proclaim, the gift of an heavenly Spirit to help our infirmities in this respect: "Seeing then," says he, "that it cannot be safe for thee to come to God in prayer, lest, listening to thy service as a vain profanation, he should refuse to receive such a sacrifice, and additional injury alone should result,—it seems to me most advisable to continue in silence till we may clearly learn what dispositions towards God and man are most fitting." "But when (it is asked), when shall that time arrive? and who is he that shall so instruct us? for most gladly would we behold who that man may be." "He it is," is the answer, "who regardeth thee with tender care: but it

seemeth to me that, as Homer represents Minerva to have removed from the eyes of Diomede their mortal mist, and thus to have enabled him

> ' With piercing glance the varied field to scan,
> And view with clear discernment God and man,'—

even so must this Instructor remove the darkness from thy soul, that it may be directed to really beneficial objects, and enabled rightly to discern between good and evil, which is beyond its present power."—" O may he," rejoins the Disciple, " may he, if he be willing, remove this darkness, and every other hindrance, for I am fully persuaded to evade none of his ordinances, whosoever this instructor may be, provided only I may be rendered more virtuous by his influence." —" Yea, wonderful indeed," concludes Socrates, " is the loving regard which he beareth towards thee."—(Alcibiades II. Plat. ed. Serr. ii. p. 150.)

Thus far could a keen sense of the wants, weakness, and ignorance of our nature, open the eyes of those in whom the greatest powers of that nature were most fully developed, to some foresight, as it would seem, of the only means by which those wants could be supplied, that weakness strengthened, that ignorance enlightened. Must we not feel, then, when we look back on the earnest aspirations of such minds, impressed with a grateful sense of our superior advantages; " for, verily, many of the most illustrious of our race have desired to see those things which we see, and have not seen them; and to hear those things which we hear, and have not heard them*."

* A passage from the beginning of the 2nd Book of Plato's Republic, which contains a striking picture of a just man ex-

Under the influence of the views which I have endeavoured to lay before you, many of the friends of this establishment have judged it right to provide for the Course of Theological instruction which I am thus called upon to open; and from the principles of the Special Committee, whose delegate I am, this provision is made with an especial reference to the members of that particular religious communion, into whose ministry I have myself entered,—with feeble powers, indeed; but I trust with the fullest and sincerest conviction of my best judgement.

In this Preliminary Address, then, I will generally state the order of the Course, and incorpo-

posed to calumny, persecution, and death, has sometimes been inconsiderately quoted, and without proper attention to the context in which it stands, in terms which almost seem to represent it as directly prophetical of the great fundamental fact of our religion, or at least as implying an intimate acquaintance with the 53rd of Isaiah. But judiciously considered, the passage will, I think, appear only a natural illustration of his argument.—Having laid down Justice as the foundation of his Republic, it becomes necessary accurately to investigate the essential nature and properties of that virtue; it must therefore be distinguished from the hypocritical pretences of those whose aim is *to seem*, rather than *to be*, virtuous; the superiority of the sincerely and abstractedly just man is strongly insisted on, who of course must, to illustrate his essential character, be considered stript of all external advantages and even reputation (which might otherwise seem his real objects). An objector is supposed to inquire, What if your abstractedly just man should be calumniated, scourged, tortured, bound, have his eyes burnt out and be impaled,—would you not admit, amidst his calamities, that he would have acted more reasonably in preferring the *videri* to the *esse?* Of course such an objection requires only to be stated to be refuted.

rate a few introductory observations on its several leading topics.

We necessarily commence with the Evidences of Natural Religion;—thence we proceed to the striking analogy between the truths thus learnt concerning the natural government of the universe by the Deity, and those which Revelation hath made known concerning his moral and spiritual government of his reasonable creatures. We shall then enter on the more particular evidences of that Revelation,—both external, as derived from the historical certainty of the miracles wrought for its confirmation, and the fulfilment of the prophecies which it comprises; and internal, as derived from the doctrines which it inculcates. This last subject will naturally lead us to the exposition of the view of those doctrines embraced by our Church:—*our* Church, I say; for it must be remembered that none are now *necessarily* present who are not members of that communion; and whom those to whose authority Providence hath delegated the guardianship of their youth, do not wish to train up in its principles. Should any other accidentally hear me, they will, I trust, hear me in the spirit of charity, as it will be my own earnest endeavour and prayer to speak in the spirit of charity: they will allow, I hope, that we,—being deeply convinced that in these principles our Church is built on the foundation of the apostles and the prophets, Jesus Christ himself being the chief corner-stone,—could not, without a gross dereliction of our duty, fail to inculcate them on you, our Christian brethren; in order that ye also may, as the apostle adds, "be builded to-

gether in him, for an habitation of God through the spirit." As to the spirit in which I would, on my part, endeavour to discharge this solemn duty,—may I always be enabled to keep in mind the admirable cautions of one, who is himself far the ablest champion in the present day of the doctrines I would advocate, although being separated by some minor questions of discipline, comparatively immaterial, he walketh not entirely with us,—I mean that most accomplished scholar and acute reasoner, Dr. Pye Smith.

This writer represents the want of just respect to the persons of opponents, and of fair and honest representation of their sentiments and arguments, as the great fault in theological controversy; and reprobates it with severe abhorrence. "This delinquency," says he, "is of no light guilt, before man, and in the sight of the righteous God. It is at least the offspring of ignorance and prejudice, and it never fails to inflict deep injury on the cause which has the misfortune to be so defended. 'A servant of the Lord ought not to strive' in angry contention, 'but to be gentle to all; apt to teach, patient of wrong, in meekness instructing the opposers.' Nothing can justify the misrepresentation of a doctrine, or an argument, or an inference, charged upon those whose opinions we controvert; nor ought we to allow a moment's countenance to calumnies against character. In acknowledging what is excellent and praiseworthy in an adversary, an honourable and Christian mind will feel a pleasure the greater because he is an adversary. The love of truth, as to Christian doctrine, cannot be genuine and

consistent, if not conjoined with the practice of truth in our sentiments and feelings towards our fellow-creatures. If, with regard to any religious errors, it be our serious persuasion that they subvert the very foundations of holiness and hope, and that the unhappy persons who embrace them are placed under grave spiritual disadvantages; the proper concomitant of this distressing conviction will be, a tender care that we do nothing tending to fortify their prejudices, or to put an additional stumbling-block in their way. If, by any want of equity and Christian dispositions, we repel and alienate them from the truth which must be received that men be saved, we sin most awfully against God; and have we not reason to expect, that 'their blood will be required at our hands'?" —(Smith's Scrip. Test. to Messiah, i. 62.)

But to proceed. I have stated that our Course will of necessity commence with the Evidences of Natural Theology. Incomplete as it is in itself, and introductory only to the fuller light of Revelation, still it is in one sense prior in *order*. As the apostle argues, "he that cometh to God must believe that he is, and that he is a rewarder of them that seek him," a general apprehension of those great primary truths, the existence of a Deity and of his moral government of the universe, constitutes what may be called an elementary faith, lying at the very root of all further faith; a point obvious as it is, yet, I am persuaded, often practically overlooked by those who, with the best intentions, are vainly labouring at the superstructure, when they ought to be laying the first foundations, and inculcating the higher and peculiar

points of Christian faith, when this previous and elementary faith yet requires to be formed, or at least to be firmly established. Now the great advantage, as I take it, of having acquired the habit of looking "through Nature up to Nature's God," is, that he is there as it were presented to us at every turn; the conviction of his being forces itself upon us from every surrounding object; and this is especially the case when the mind is otherwise employed on the most engaging and elevating objects of its knowledge. When Science unfolds to it the great system of the universe, the admirable adaptation of all its parts, the multiplicity of ends which all its general laws fulfill, and the exquisite artifice of all the living frames that move and have their being therein; and one great conclusion irresistibly flows from all,—must not an habitual feeling of devotion in every well constituted mind be thus associated, and as it were identified, with the most gratifying exercise of its highest faculties? How well has a writer (who stands at present first in the ranks of science, to which he is alike endeared by his paternal name and his own) remarked, that although "No doubt the testimony of natural reason on whatever exercised, must of necessity stop short of those truths which it is the object of Revelation to make known; still it places the existence and personal attributes of the Deity on such grounds, as to render doubts absurd, and atheism ridiculous."—(Herschel's Discourse on Nat. Phil.)

Reserving then for the third and concluding part of the Inaugural Address which I have now commenced, our introductory survey of the pecu-

liar evidences and doctrinal character of the Christian Revelation, I shall devote the next division to the general development of the argument suggested by the proofs of design and intelligence evinced in the works of creation.

Now that this argument is in any way inappropriate to our present theological course, can be considered only by those who forget that an inspired apostle hath expressly appealed to it, when he declares, "that the invisible things of the Deity from the creation of the world are clearly understood from the things that are made, even his eternal power and Godhead." On this subject I would only add a short quotation from a Father of the Church, whose warm devotional feelings and deep experience of the vital influence of religion have ever given a peculiar weight to his authority with those of congenial sentiments; I mean Saint Augustin.

"Far is it from vain and idle," saith he, "to contemplate the beauty of the heavens, the order of the stars, the lustre of light, the vicissitudes of day and night, the monthly course of the moon, the temperature of the seasons, the immense abundance of seeds reproducing species and individuals, each preserving its proper generic nature and condition. For in this contemplation a vain and perishable curiosity is not to be exercised, but an advance is to be made towards objects immortal and perpetually enduring. For it is not the authority of the divine books alone which proclaims a God; but every argument from things surrounding us, and to which we ourselves bear relation, attests it likewise; since Universal Na-

ture declares itself to have proceeded from a supremely excellent Creator, whose Eternity is understood from its perpetuity; his Omnipotence from its greatness; his Wisdom from its order and disposition; and his Goodness from its government*.

* August. de Verâ Relig. cap. 28 : de Trinitate, l. 15, c. 3; et super Ioan.

PART II.

ON THE NATURAL EVIDENCES OF THEOLOGY AS DEDUCED FROM THE SEVERAL BRANCHES OF SCIENCE.

In continuing the subject opened in my last Address, it becomes my present duty to enter upon an introductory survey of the general nature of those evidences of religion to which it will be the business of the present Course to direct your attention. And first, as preliminary in point of order and method, we have to examine those countless attestations which the universal design pervading the whole frame of nature bears to the existence of a great intelligent First Cause. The short outline indeed which I can now offer, will I doubt not be much more ably filled up by those whom I am most happy to have as my colleagues in this duty: yet some general and preliminary notice seems to me a natural portion of the Inaugural Address; and the opportunity of casting a general glance, however slight, over subjects so calculated to draw out all our highest faculties to their utmost stretch in admiration and adoration, is so gratifying to every feeling of my mind, as to lead me irresistibly forward.

I have to begin, then, with pointing out the general line of argument to be drawn from our scientific examination of the works and laws of Nature as they are usually called; but which, as we shall see in every place and at every moment, proclaim in terms not to be overlooked or mis-

understood, the great Author of Nature. When we see all around, myriads and myriads of combinations which it would be utterly ridiculous and against every principle of reason and philosophy to ascribe to chance, continually presenting themselves; all directed by the most exquisite skill to ends the most extensively beneficial, it is absolutely impossible for any sane mind to doubt of the Intelligence which has arranged, and which perpetually governs those combinations; and the whole doctrine of final causes stands forth in its full lustre. Narrow and very ill-informed views may sometimes indeed have led to the overlooking these causes, as if less directly connected with science; but in truth, the final causes are generally much more strictly and fully within our cognisance than the efficient or material causes of nature. What may be the material essence of light, or in what manner it can affect our senses through the medium of the nerves, we are, and must probably ever remain, ignorant: but the useful ends for which it was necessary that we should thus become acquainted with the external objects of nature, we know full well. In proceeding, I shall at present attempt only to take the briefest general survey possible of the abundant illustrations of these final causes, which every branch of science you can pursue presents.

DYNAMICS.

At the first portal of Science is placed the mathematical investigation of the primary laws of matter and motion, or what are called Dynamics. Now here we have to observe the universal appli-

cation of these laws, and the infinite multiplicity of ends attained by the efficiency of a few simple principles; to the action of which, therefore, the whole frame of nature, throughout all its parts, must be nicely adjusted; the physical constitution of all its masses, and the mechanical structure of every living frame it contains requiring to be regulated in exact accordance with them. One of our poets has observed, not more beautifully than philosophically, that—

"The very law that moulds a tear,
And bids it trickle from its source,
That law maintains the world a sphere,
And guides the planets in their course."

The wing of the meanest and minutest insect which the passing breeze wafts by us, even those which man requires the aid of the microscope to enable him to discern, must have its muscular powers, and the mechanism by which they act, as exquisitely adjusted to the operation of those laws in the medium in which it lives and moves and has its being, as the grand mass of Jupiter majestically sailing, surrounded by its attendant moons, through the vast plains of æther.

ASTRONOMY.

Astronomy, however, undoubtedly affords the most sublime exemplification of these laws, and that which has in every age been considered as affording the noblest illustration of the wisdom and power of the great First Cause. To this the inspired Psalmist repeatedly alludes in his loftiest and warmest devotional strains; and as he informs us, "That the words of these heavenly bodies had

gone out to the ends of the world, and there was no tongue or language where their voice was not heard;" so we shall find that it was from hence that those unblest with Revelation were enabled to approximate most nearly to some just conceptions of the Divine attributes. Classical antiquity has bequeathed to us no finer address to the Deity than the Hymn of Cleanthes the Stoic, in which we read,—

Σοι μεν πας ὁδε κοσμος ελλισσομενος περι γαιαν
Πειθεται ἡ κεν αγης, και εκων ὑπο Σειο κρατειται.

"This circling universe, its willing way
Bends where thou biddst, and worlds thy Word obey."

Here the first remarkable instance of design and contrivance is the exactly adjusting the projectile force which impels every planet in its course to the attractive power which draws it towards the central sun, in that single proportion which enables these forces by their composition to produce orbits very nearly circular: as we know that the one of these forces (gravitation) varies in each planet, the other (the projectile force) must of course vary also. In each instance, out of the infinite possible number of combinations of these forces, but one would produce the ellipses of small eccentricity which are actually described, and of the great advantages of which, in regulating the seasons, we are well aware in our own case, and may extend our inferences as far as analogy warrants our believing that the beings inhabiting the planetary system generally are at all of similar nature. Now, that the frequent recurrence of this particular combination is by no means the result of any physical necessity of the case, is evident, from the orbits

which have been ascertained to belong to the comets, which occasionally in one part of their path approach so nearly to the sun as to be heated two thousand times more than red-hot iron; and in another become so remote, as to view the sun only as we do a fixed star, and to derive scarcely more of light or heat from his beams.

Now assuredly it were too hasty to conclude that even such conditions preclude every modification of life. Undoubtedly it were more agreeable to all that we know of the dispensations of Him who filleth all space with things living, and all things living with his goodness, to believe that the infinite treasures of his wisdom may also have provided creatures calculated to endure even these extreme circumstances; or have (as we see done in many known instances) allayed and mitigated them by some secret compensations, so as to have rendered them tolerable*. Still we here see, at any rate, how nicely the constitution of the creatures inhabiting our own planet is adjusted to its path, a path evidently impressed upon it by design; for, as I have said, it is one only out of millions of possible combinations, which could

* Thus we know the heat imparted by the solar beams to vary with the rarefaction or condensation of the surrounding atmosphere: rarefied air (as we experience on the summits of mountain chains) having its capacity for heat so increased as to absorb and render latent large supplies of it, which in a condensed state it readily emits and imparts to surrounding objects. Now we may infer from the phænomena of their tails, that the atmospheres of comets are greatly rarefied at their perihelion; so that they may perhaps there absorb and conceal much of the heat, which, being equally condensed in the aphelion, may be thus given out when most required.

have impressed on our own globe the course which bringeth the regular return of its seasons, crowning the year with his goodness, who ordained this orbit, which might else by very many equally possible chances have deviated even into a comet's course, at once destructive of every creature that moves and every plant that blossoms, as they now exist. Another instance of the adjustment of forces, though by no means confined within such narrow limits as the former, may I think be observed in the so regulating the velocity of the rotation of each planet on its own axis, that the centrifugal force thence resulting, can never exceed such a proportion as leaves it still easily controlled by the gravitation arising from the mass of the same planet. For instance, in our own planet, the velocity of rotation is such as carries with it any body situated at the equator 1042 miles every hour, or rather more than a quarter of a mile in a second. But had this velocity been increased about twenty times, so as to produce a motion of five miles in a second, (the mass of the earth, and consequently its attraction of gravitation remaining the same,) we know that the centrifugal force thence resulting would be sufficient to detach any bodies which might be loosened, causing them to revolve like satellites; —a gale of wind might thus carry off the roofs of our mansions and every thing which could be torn loose.

But the most beautiful extension of the doctrine of final causes has been disclosed by those extraordinary and elaborate researches, through which our theory of Physical Astronomy has received its full

development and perfection, and the mechanism of the heavens, as it has been appropriately termed, laid open to our admiring inspection. Now if we consider it, and consider it justly to be the grand triumph and noblest boast of man's reasoning powers, thus to have unravelled a portion of that universal mechanism,—how must we conceive of that intellect which planned, executed, and sustains the whole! of which the specimen visible and cognisable by us, forms probably but an infinitesimal fraction!—But to return. That great inventive mind which firmly laid the whole foundations of this sublime science, and in every respect pointed out to his successors the true methods of investigation to be pursued, still left his grand system in parts incomplete. It is truly wonderful indeed, that the transient life of one man (especially when it is remembered that from the probable exhaustion of an overworn mind he was compelled to suspend his researches at an age by no means advanced); it is wonderful, I say, that his span of intellectual energy should have sufficed to have accomplished one-half of what Newton did perform, rather than surprising that he should have left it to others to complete a portion of the superstructure which has given its full dimensions and compact solidity to that magnificent Temple of Nature (or rather let me again say of the God of Nature) which his mind conceived, and his hands mostly erected. Newton in his investigations had become completely aware of the perturbing forces arising from the interfering attractions of the planets on each other, &c., which affect and appear to threaten the permanent sta-

bility of the system. He was, indeed, inclined to believe, that these perturbations were such as to render it necessary that the Deity should from time to time, directly and as it were miraculously, interfere (without the intervention of those general and ordinary laws of secondary means which his wisdom at first appointed) in order to rectify these disturbances, and to prevent the system from being hurried by them into disorder and destruction. But far more sublime and more worthy of the great Creator seem to me the views opened by the more recent discoveries of science, which, in pursuing to its full results and perfecting in all its details the Newtonian theory, have established, that he has from the beginning secured by a most exquisite and never to be shaken arrangement, the permanent stability of all the parts of the system: that when at the first he spoke the word and they were made; when he originally commanded and they were created; by that same word he made them fast for ever and ever, and gave them a law which never shall be broken. For by fully tracing out the universal power of gravitation through all its abstruse combinations, it has at length been completely demonstrated, that all the anomalies in our system are what are called secular variations, that is, periodical inequalities, oscillating only within fixed and narrow limits; and destined, after running through a certain course, to return by a fixed appointment of nature into the same order. And that the great points of the mean distances (from the sun) and mean motions (or revolutions) of the planets being constantly invariable, all permanent and destructive effects

from the disturbing causes are thus overruled; and even in the midst of seeming danger, stability is established on the securest basis. Now, as an able exponent of these discoveries has excellently observed*, "When we consider the provision thus made by Nature for the stability and permanence of the planetary system, an important question arises, Whether is this stability necessary or contingent? the effect of an unavoidable or an arbitrary arrangement? for if it were the necessary consequence of conditions themselves, we could not infer from them the existence of design, but must content ourselves with admiring them as simple and beautiful truths, having a necessary and independent existence. But if, on the other hand, the conditions from which this stability arises necessarily are not necessary themselves, but the consequences of an arrangement which might have been different, we are then assuredly entitled to conclude, that it is the effect of *wise design exercised in the construction of the universe.*

"Now the investigations of La Place enable us to give a very satisfactory reply to these questions, viz.—That the conditions essential to the stability of a system of bodies gravitating mutually to one another are by no means necessary, insomuch that systems can easily be supposed in which no such stability exists. The conditions essential to it, are, the movement of the bodies all in one direction, their having orbits of small eccentricity, or not far different from circles, and having periods of revolution not commensurable with one another. Now these conditions are not necessary; they may

* Playfair.

be easily supposed different; any of them might be changed, while the others remained the same. The appointment of such conditions, therefore, as would necessarily give a permanent and stable character to the system is not the work of necessity, and no one will be so absurd as to argue that it is the work of chance. *It is therefore the work of design or of intention, conducted by wisdom and foresight of the most perfect kind.*"—(Ed. Review, vol. xi.)

Before I quit the subject of Astronomy, I cannot fail to point out the nice adjustment by which the physical constitution and power of the animal inhabitants and vegetable products of our own planet are so exactly adapted to the condition of that planet, as influenced by its distance from the sun, and many other circumstances; that all things here conspire together for their well-being: although the same constitution would be often inconsistent with the comfortable and vigorous existence of races similarly organized on some of the other planets. We need not indeed doubt that those other planets are equally inhabited and occupied; analogy would on the contrary rather lead us to conclude that they are all likewise fully tenanted by beings equally adjusted to their respective situations. But this nice adjustment, by which every thing is rendered exactly suitable to the physical circumstances of its particular situation, most clearly implies design and intelligence. To illustrate this, let us consider how animals and vegetables like those with which we are acquainted would fare if they had been called into existence on the face of Jupiter instead of the Earth,—which is certainly a

chance equally supposable, if *chance* had exerted any influence in their disposition. Now the quantity of matter in Jupiter is more than 312 times that contained in the Earth, its attraction of gravitation must therefore be vastly greater;—the muscular powers of the terrestrial animals, exactly calculated to their proper situation, would here scarcely suffice to drag their wearied limbs along with the most painful struggles. If the planet has an atmosphere constituted like ours, it must of course exist in a degree of condensation vastly greater, in consequence of the superior gravitation. Now it is well known how great is the inconvenience experienced, even in an atmosphere slightly condensed, by those who have ever descended in diving-bells: but how infinitely greater must the labours of respiration become, were our atmosphere condensed by a gravitation equal to that of Jupiter? The birds also, which here wing their light way through the thin breeze, would there have to struggle through a medium dense as water. We know not indeed whether Jupiter has an atmosphere, or what are its circumstances; but yet there is one ground which may lead us to believe that it has one highly condensed, because this in fact would form a compensation in one important point admirably adjusted to its particular circumstances. The solar beams there received, and the consequent influences of light and heat thence derived, are only in the proportion of one twenty-eighth to those which fall on the earth. But we well know that the actual heat given out is altogether dependent on the state of rarefaction or condensation of the atmosphere, since in the

former state its capacity for heat being increased, it absorbs the caloric and renders it latent, but readily gives it out in the latter state. The superior condensation of Jupiter's atmosphere, therefore, may materially compensate the less quantity of heat incident from the sun. I have not yet spoken of our vegetables: but as Jupiter, having its axis of rotation at right angles to the plane of the ecliptic, can have no change of season, it may be doubted whether our vegetables, adapted for an alternation of excitement and repose in the vicissitudes of summer and winter, could endure the perpetual stimulus of a *ver assiduum*. But not only do the organized beings of our planet exhibit these proofs of due adjustment to their place, but we may further extend the observation to its inorganic masses. It has been calculated, for instance, that the amount of the possible disturbances affecting our ocean mainly depend on the density of its waters, as compared with the density of the earth supporting them: if the densities of both were equal, the ocean would be liable to tremendous oscillations, which might often carry its waves in deluges of destruction over the face of our continents. Now, as the density of the matter composing Jupiter scarcely exceeds that of water; if it possessed an ocean constituted like ours, this danger must be always threatening it: but as the density of the solid materials of our earth exceeds five times that of water, no such catastrophe can be here apprehended. Thus has the great Arranger of Nature given to the floods a limit which they shall not pass, neither turn again to cover the earth. How truly may we say, with the great

Newton, "Elegantissima hæc compages non nisi consilio et dominio entis intelligentis et potentis oriri potuit."

GEOLOGY.

As a kindred branch of cosmical science, Geology may be ranked next in order to Astronomy (though undoubtedly at a vast interval, if the powers of mind by which the two have been cultivated be taken into account). Here, in the alternation of strata pervious to water, and those which are impenetrable by that fluid, we find, as evinced by wells and springs, the most admirable contrivance for collecting and distributing the rains that fall from the clouds for the purpose of forming the general irrigation of the earth,—a system quite perfect in its kind. The proportion of the surfaces of our oceans and continents also enters into this account: for the former, the surface of the seas, evidently afford the first grand source of this supply by evaporation, which thence rising in clouds through the air is precipitated in showers, percolates through the porous strata, thence oozes in a thousand rills through valleys seemingly excavated on purpose for its conveyance, which inosculate successively into the larger courses of rivers, in a manner very similar to the inosculation of the smaller ramifications into the greater trunks of the venous system in animals, to which it has been aptly compared; and by these channels the streams return to their original parent, the sea, to be thence again raised by fresh evaporation—a complete circulation being thus established. Now had the proportion of the seas to

the continents been greater, the supply would probably have been superabundant; if less, deficient: as it is, it is suitably adjusted to the wants of nature. Now in Geology I would particularly observe, that the inferences as to the intervention of a Deity are rendered far more cogent than in almost any other branch of science; because Geological phænomena clearly prove that the present face of things has been preceded, and indeed has resulted from, scenes marked by the most violent convulsions and disturbances. Now how can we possibly conceive that the admirable order we behold has been educed out of, and indeed in many cases has been effected by, catastrophes of ruin and confusion, unless we believe that a Being of infinite power and wisdom, "rode in the whirlwind and controlled the storm!" For instance, we observe the most indisputable proofs that the whole of our continents were formed originally beneath the bosom of the ocean, and have been thence elevated by forces probably analogous to volcanic agency, of which ineffaceable traces remain in the dislocations and disturbances of the strata; the valleys, which afford such an admirable system for performing the part we have seen assigned to them in that revolution of the waters which we have described, appear partly to have originated in these dislocations of the surface, and partly to have been excavated by grand diluvial currents sweeping over that surface with the most tremendous and destructive energy. Of these there may have been more than one epoch: the earliest may have been occasioned by the great change of the relative level of sea and land which occurred when the continents

emerged, and the oceans assumed their present relative situation, which a late writer (very justly I think) supposes to have been alluded to in the Mosaic narrative, where it is said that the command was given, "Let the waters be gathered together unto one place, and let the dry land appear." The latest diluvial convulsion, I need not add, is distinctly recorded in the sacred page. But Geology is, I think, most important, as showing by the irrefutable evidence of these convulsions, and of an order of things in which the globe must have been untenantable by the present races of animals, that the actual order of things has not been constant and invariable, but must necessarily have had a beginning;—"For it has ever been the refuge of scepticism, to believe that the laws of Nature, being fixed, permanent and invariable, this frame of things is eternal; that the earth and all the apparatus of bodies in this and other systems were ever in the state they now are, and will ever continue the same. In this their scheme they think no God needful*."—Now all these atheistical assumptions are most decidedly and unanswerably negatived in every page of Geology. But the most important point in this argument has been most convincingly stated by an author equally distinguished for the great extent of his attainments, and the strength and soundness of the ratiocination which he has ap-

* See an admirable passage in Dr. Woodward's Natural History of the Earth, p. 9. to which I am happy to acknowledge myself indebted for suggesting this argument, although of course I have been obliged to rectify his statements according to our present state of knowledge.

plied to the multifarious subjects which he has cultivated, not superficially, but to the very bottom —an authority also especially endeared to us as one of the principal founders and warmest friends of this Institution. I cannot therefore do better than quote from Dr. Prichard's admirable Essay on the physical history of Mankind the following passage*. "It is well known that all the strata of which our continents are composed were once a part of the ocean's bed. There is no land in existence which was not formed beneath the sea, or

* Prichard's Researches into the Physical History of Mankind, vol. ii. p. 594.

This great point of the recent origin of man is admitted by all Geologists, however various and even discordant their theoretical views. I am most happy to be able to quote on this subject the consentaneous testimony of that singularly able work, "Lyell's Principles of Geology," although it must be well known to all interested in the science, that I widely dissent from the author in many of his speculative ideas; but on this very account it is the more gratifying to me to show, that our differences, whatever they may be, do not in any manner affect the important application of the science which I have endeavoured to enforce and illustrate in the text.—"We need not," says this writer, "dwell on the proofs of the low antiquity of our species, for it is not controverted by any Geologist, &c. The establishment by Geological evidence of the first intervention of such a peculiar and unprecedented agency long after other parts of the animate and inanimate world existed, affords ground for concluding, that the experience, during thousands of ages, of all the events which may happen on this globe, would not enable a philosopher to speculate with confidence concerning future contingencies . . . . . had he previously presumed to dogmatize respecting the absolute uniformity of the order of nature, he would undoubtedly be checked by witnessing this new and unexpected event."—(Principles of Geology, vol. i. pp. 153—164.)

that has not risen from beneath the water. Mankind had a beginning, since we can now look back to the period when the surface on which they live began to exist. We have only to go back in imagination to that age, to represent to ourselves that at a certain time there existed nothing in this globe but unformed elements, and that in the next period there had begun to breathe and move, in a particular spot, a human creature; and we shall already have admitted perhaps the most astonishing miracle recorded in Scripture. After contemplating this phænomenon, we shall find no difficulty in allowing, that events which would now be so extraordinary that they might be termed almost incredible, (our confidence in the present order of things having been established by the uniform experience of so many ages,) would at one time have given no just cause for wonder or scepticism. In the first ages of the world, events were conducted by operative causes of a different kind from those which are now in action; and there is nothing contrary to common sense or to probability in the supposition, that this sort of agency continued to operate from time to time as long as it was required,—that is, until the physical and moral constitution of things now existing was completed, and the design of Providence attained.*

* Hume has objected to the argument from design, that if we consider the perfect system of nature as inferring a designer, then, by parity of reasoning, that perfect designing being must infer a prior designer, and so on *ad infinitum*. Now it seems clear that this objection, if pressed, must immediately resolve itself into a mode of Pantheism; for our answer will of course be, "That the only conclusion in which our reason can repose, is the idea of a first cause eternally, necessarily and self-existent;

Since the above paragraphs were first written, an Address, delivered to the Geological Society of London by its very able president, Professor Sedgwick, has just appeared, which contains some remarks on this application of geological science which I am much gratified in being able to subjoin as an appropriate conclusion to the present branch of our argument.

"Geology lends a great and unexpected aid to the doctrine of final causes; for it has not merely added to the cumulative argument, by the supply of new and striking instances, of mechanical structure adjusted to a purpose and that purpose accomplished; but it has also proved that the same pervading active principle, manifesting its power in our times, has also manifested its power in times long anterior to the records of our existence.

"But after all, some men seeing nothing but uni-

and that the idea of any thing prior, therefore, involves a contradiction in terms." And if the opponent would still urge his objection, he must, I conceive, remodel it thus: "Why may not the natural universe itself be that eternally necessarily and self-existent perfect being?" which in effect is Pantheism. Now the arguments in the text appear to me to be the most conclusive against all these sophisms: for they show that the present frame of nature has not possessed this eternal and necessary existence: they palpably demonstrate that many of the most important parts of the design of nature have had a beginning, and were altogether foreign to all the parts of the fabric of nature which preceded. Thus the conclusion of a first cause and original designer altogether extraneous to the material universe appears inevitable.—The argument from design has always seemed to me to require the demonstration of the non-eternity of the present state of nature (that state in which the design is evinced) to complete its cogency; and geological evidence may perhaps be considered as most clearly supplying this demonstration.

formity and continuity in the works of nature, have still contended (with what I think a mistaken zeal for the honour of sacred truth), that the argument from final causes proves nothing more than a quiescent intelligence. I feel not the force of this objection. In geology, however, we can meet it by another direct argument; for we not only find in our formations organs mechanically constructed —but at different epochs in the history of the earth we have great changes of external conditions, and corresponding changes of organic structure; and all this without the shadow of a proof that one system of things graduates into, or is the necessary and efficient cause of, the other. Yet in all these instances of change, the organs, as far as we can comprehend their use, are exactly those which were best suited to the functions of the being. Hence we not only show intelligence contriving means adapted to an end, but at successive times and periods contriving a change of mechanism adapted to a change in external conditions. If this be not the operation of a prospective and active intelligence, where are we to look for it?"

The sciences which relate to the material constituents of nature, their properties and reciprocal action, next present themselves; such as the history of light, of heat, of electricity, and that investigation of the composition of bodies, and of the character and relation of their elements, usually included under the term of Chemical Philosophy.

LIGHT.

Of Light, the grand medium of our knowledge of external nature, the voice as it were with which the God of Nature has endowed its material objects, to place them in relation and communication with its intellectual agents,—why should I speak? This great end it could not accomplish, were not all its optical laws, the properties of the objects on which it falls, and of every humour of the eyes which it traverses, nicely regulated in reciprocal relations. For instance, if bodies generally had been unable to reflect rays (which the phænomena of polarization show to be possible under given circumstances), or had the humours of the eye been possessed of double refraction, as many substances are, vision must have been in the one case null, in the other so confused as to be useless. Paley, whose work will be the text-book of this collegiate class, has so fully described the exquisite structure of the eye as a regular optical instrument, that I need only observe, that he who believes a telescope or microscope to be the work of design, and doubts this of an eye, must believe that a perfect instrument exhibits less proof of contrivance than an imperfect one of the very same kind. Light also, evolved as it is from the great luminary of our system, and acting on an insect's eye, shows the universal relations that pervade that system from its greatest bodies to its meanest tenants. It further illustrates the great multiplicity of useful ends, seemingly quite unconnected, accomplished by an individual principle, since it is known to be important as a chemical agent.

HEAT.

Heat is equally conducive to the support of animal and vegetable life; and it is an indispensable agent in many of the most important chemical operations of nature, and of the same necessity to sustain both the atmosphere and the waters of the earth in the condition which enables them to fulfil their important purposes in the œconomy of nature. What a number and variety of nicely adjusted relations are implied in this short statement! The laws by which it is evolved in combustion especially demand our notice, as these seem to have an especial reference to the comforts of man and to the arts of human life, and therefore seem to imply a foresight of those wants, and the arts which supply them. I have sometimes been led, further, from this fact to inquire whether we might not, in the suitableness of natural agents to afford materials for the arts invented by man's reason, discover a *prophetic anticipation* and *prospective provision* for those arts; whether, for instance, admitting the laws of the evolution of heat in combustion to have been designed with reference to our artificial comforts, we may not equally conclude, its agency in the production of the immense power arising from the elasticity of steam, to have been equally an intentional provision for our use as science advanced?—an opinion which would identify that advance with the designs of the Author of our reason. But I propose this only as a query, and with diffidence*: at

* The idea, that in many instances such anticipative provisions, having a designed reference to the future and progressive developments of human arts and discoveries of human

any rate, however, the influence of heat in evaporation is undoubtedly a most splendid instance of beneficial contrivance ; for had not water and heat been related in such a manner, that this effect must

science, is one on which I could willingly dilate, did I not fear the charge of running into fanciful speculation. I am aware, indeed, that the Lucretian argument,

> " Nil adeo quoniam natum est in rebus ut uti
> Possemus, sed quod natum est id procreat usum—"

may seem more plausibly applicable against this view than on the subject to which he directed it:—to me, however, every analogy seems strongly favourable to such a supposition. If, for example, we consider the case of the insect societies,—since we often see tribes of insects hatched at the very season when the vegetables forming their appropriate nutriment are developed ; the relations in this case are such, that we cannot doubt the one to have been intentionally provided for the other. But to those tribes which construct regular habitations for themselves, and receptacles for their young and their food, the materials whence these are fabricated are obviously no less essential to their animal œconomy than is their nutriment ; and we find both equally provided by the same bountiful hand of nature ;—Can we then believe that the provision is in the one instance intentional, but in the other accidental ? Shall we say that the nectarine juices of flowers and their pollen afford sustenance to bees by design, but that the vegetable materials whence (by an adapted animal organization) they secrete their wax, and the resinous gums found in certain trees (such as the birch, willow, and poplar), which constitute their propolis, are made subservient to their use in the construction of their cells only through mere chance ? But surely the architecture and arts of bees differ from those of men in degree rather than in nature ; and if it be said that the one are the necessary consequences of immutable instincts, and the other the contingent discoveries of progressive reason ; still there seems nothing in this distinction which can render it probable that the Universal Cause should in his designs so fully provide for every thing necessary for the accomplishment of the purposes suggested by the former mental prin-

necessarily result from their reciprocal action, the clouds of heaven could never have dropped fatness, and all vegetable and animal life had quickly perished in intolerable drought. For this end it

ciple, and have left the other in the hands of chance. The medical properties of so many natural substances seem to afford a strong confirmation of this argument. Can we suppose the febrifuge qualities of the bark of the Cinchona less the effect of intentional design, than the nutritive properties of every green herb given for food to animal nature? Yet the general application of this remedial principle was dependent on the progress of navigation, and the discovery of the continent to which the Cinchona is limited: and we see many of the most important medical substances latent for ages, until, as in the case of Iodine, the most recent chemical discoveries have introduced them to common use. The application of the polarity of the magnet to the purposes of navigation affords another example of the class of cases; concerning which I would inquire, whether we may not consider such an application to have been an object of design in the original constitution of things. It is true, indeed, that this is only one result of the general principle of polarity, which probably answers many much higher and more important purposes than those of human navigation: but this is surely no objection; for in the œconomy of nature, one of the most admirable circumstances is the great multiplicity of useful purposes answered by some single and simple provision, often in addition to that which seems its most obvious and principal end. Thus, in the case of the bees before alluded to, no one can believe that it is the principal end of the inflorescence, so necessary to the perpetuation of the vegetables themselves, to furnish these insects with honey or pollen; yet no one can, I think, deny that this, though a subordinate purpose, was yet one of those contemplated in the design of the creating intelligence. Nor do we, I think, feel any inconsistency when we read that God set the luminaries in the firmament of heaven to rule the day and the night, and to be for signs and for seasons and for days and for years; though we assuredly know that this can be only a secondary and subordinate design answered by these great bodies in the system of the universe.

was equally necessary that the constitution and relations of the atmosphere should be adjusted so as to co-operate: and we have before seen how the geological structure of the earth has been regulated in subserviency to the same end, by the distribution and circulation of these waters. What multitudes of relations must be thus made to conspire together to work out a single end! The mind is almost lost in the contemplation; and can only exclaim, "O Lord, how manifold are thy works, in wisdom thou hast made them all!"

ELECTRICITY.

Of electricity, the infancy of the science forbids my speaking at any length. We have, however, grounds for believing that all the attractions of chemistry depend on this principle; and the recent discoveries of electro-magnetism exhibiting remarkable analogies to the planetary motions, in the production of gyrations which in like manner necessarily revolve in one and the same direction, may induce us to suspect,—as we certainly know that one of those planets, our own, is endowed with magnetical polarity,—that this agency is of far more importance in the system of the universe than we are yet aware of.

It seems also highly probable that the electrical power under some of its modifications may be the principal agent in the mysterious propagation of the nervous influence, and consequent excitement of muscular action through the animal frame; an opinion forcibly suggested by the phænomena of the actual development of this principle by animal mechanism in the cases of the gymnotus and tor-

pedo, and by the powerful effect which well-known experiments demonstrate that it is capable of producing on the nervous and muscular system, re-exciting almost the appearance of vitality in bodies after the flame of life had fled. The researches also of Dr. W. Philip, and other English physiologists,—in the prosecution of which it was found that when a nerve was divided so as entirely to intercept the transmission of its action, the place of the nerve might be supplied by a galvanic apparatus,—assuredly impart much of additional probability to the hypothesis of the connection of nervous influence with the electrical principle.

When another Newton shall arise to investigate, methodize, and generalize the laws of the polar forces, his harvest of important truths may perhaps be as abundant as was that of the first*: and we cannot doubt that if so, it will be equally pregnant with proofs of design. For the argument from final causes is of a cumulative nature, it ever

* Does not the language of *the* Newton, in alluding, I believe, to his supposed ætherial fluid, seem almost prophetical of such a regular theory of polar forces?—"Adjicere jam liceret nonnulla de spiritu quodam subtilissimo corpora crassa pervadente, et in iisdem latente, cujus vi et actionibus particulæ corporum ad minimas distantias se mutuo attrahant, et contiguæ factæ cohærent: et corpora electrica agunt ad distantias majores tam repellendo quam attrahendo corpuscula vicina,—et lux reflectitur, refringitur, inflectitur, et corpora calefacit; et sensatio omnis excitatur, et membra animalium ad voluntatem moventur, vibrationibus scilicet hujus spiritus per solida nervorum capillamenta ab externis sensuum organis ad cerebrum et a cerebro in musculos propagatis.—Sed hæc paucis exponi non possunt, neque adest sufficiens copia experimentorum quibus leges actionum hujus spiritus accurate determinari et monstrari debent." (*Scholium generale* at the end of the *Principia.*)—Here we see the attraction of cohe-

" grows with the growth, and strengthens with the strength" of science, continually unfolding fresh pages to the admiration of succeeding generations as they advance in intellectual progress.

CHEMISTRY.

Chemistry, as it developes the elementary composition of bodies and the laws regulating the combinations of those elements, illustrates in almost every instance the admirable adjustment of their relations to each other and to the governing laws: but time obliges me to select from this rich abundance very sparingly. It may suffice to point out only a single example: How indispensable is the atmosphere to the support of animal and vegetable life! yet it is composed of two elements, oxygen and azote, which being blended in another mode and in different proportions, furnish only acid poisons alike destructive of both,—nitrous and nitric acid, &c. Here, again, we see a striking instance of the multiplicity of beneficial ends, unconnected and sometimes seemingly opposed, effected by a single agent. The atmospheric air supports animal life by renewing the vigour of the blood, carrying off its carbonized impurities in the form of the acid produced by their union with its

rence, corpuscular attraction, of which chemical affinity may perhaps be only a modification, electrical, which of course involves magnetical attraction, optical phænomena (now extended by the discoveries of polarised light), and nervous influence, considered as probable modifications of a single principle; a generalisation bold indeed, (in the time of the author so bold that only the αγχινοια of true genius could suggest or sanction it,) but as beautiful as it is bold, and to which every subsequent discovery of science appears constantly to bring some accession of probability.

oxygen. It supports vegetable life, on the contrary, by transferring to it the materials thus abstracted from animal frames, and occasionally (during the absence of light that is) in yielding its oxygen, which uniting with the carbon already lodged in the pores of the vegetables (as derived from the vegetable soil in which they grow, &c.), thus forms carbonic acid ; through which state this nutriment of vegetables, for such carbon principally is, must pass, before it can be assimilated into their system. Under the influence of light, however, the vegetable becomes capable of decomposing the carbonic acid, appropriating solely the carbon ; and not only thus repays the oxygen it had previously borrowed, but also by decomposing those other portions of carbonic acid which the air had derived from animal respiration and wafted over to the vegetable, gives forth an independent and, as it were, gratuitous supply of the aëriform principle emphatically termed vital air. Thus the purity of the atmosphere is restored, and it becomes again fitted for animal respiration, to which it would be unsuitable if overloaded with the carbonic acid from which the vegetables thus free it. So exactly does animal respiration fit the air to support vegetable life, and vegetable respiration (if we may so speak) renew its fitness for that of animals. What an admirably adjusted balance ! and how nicely do these antagonist causes play into each other !

The atmosphere also supports combustion by parting with its oxygen.

ACOUSTICS.

Another most important and beneficial use of the atmosphere, and one totally unconnected with the former, is, that it is so constituted as to afford a medium suitable to propagate by its vibrations the impressions of sound to the animal senses. Were its properties* other than such as to fit it for receiving and transmitting these undulating vibrations, or were there not such an adjustment and adaptation of the things to be acted upon to the medium of action, as to qualify the ears of animals to be suitably affected by the impressions thus communicated, all nature would be buried in the silence of death. The audible signs by which every beast of the field, and every bird of the air, expresses its wants and affections would be cut off; the great means of communication from mind to mind of rational creatures would be annihilated; the sweet strains of harmony, which yield the purest and, if I may so speak, the most intellectual of sensual gratifications, would be hushed; and the unbroken and gloomy stillness of the grave replace the busy and happy hum of life.

ANIMAL PHYSIOLOGY.

The physiology of the organised beings, the races endowed with animal and vegetable life, finally claim our attention. We will first consider the former class. Now the frames of these beings

* Had the atmosphere been composed entirely of oxygen, the sounds would have been painfully intense. Had it been hydrogen, they would have been faintly distinguishable, and at small distances totally inaudible.

present us partly with chemical laboratories adapted to all the purposes of

> "....Nature's chemistry, by Man's
> Weak art inimitable,—"

partly they form machines constructed on the most perfect mechanical principles. We have already had frequent occasion to remark on their nice adjustment and exact adaptation to the general laws of Nature, and to their particular place in the system, and the circumstances under which they are placed; an adaptation at once precluding every possibility of ascribing their disposition to chance. The proofs of design resulting from the exquisite structure of the animal frame have been selected by Paley* as the most cogent topic of his

* In that very interesting work, Ellis's Polynesian Researches,—to which I may apply Johnson's well-known sentence, with a slight accommodation, and say that the philosopher ought to read it for its valuable information on natural history, statistics, and national manners, and the Christian for its details of the causes and effects of the great religious change effected in the insular population to which it relates,—I have met with a striking instance of the manner in which the argument, from the *mechanical* structure of the animal frame (so admirably illustrated by Paley), suggested itself to a mind previously scarcely elevated above the savage state, when that mind began to be opened and expanded by the civilizing influence of Christianity. It affords an interesting exemplification of the natural train of thought of one who may be well called a Polynesian Paley.

Mr. Ellis informs us that, "On a public occasion, in the Island of Raiatea, during the year 1825, a number of the inhabitants were conversing on the wisdom of God, which, it was observed, though so long unperceived by them, was strikingly exhibited in every object they beheld. In confirmation of this, a venerable and grey-headed man, who had formerly been a sorcerer, or priest of the evil spirit, stretched

argument, and so admirably illustrated by him, that it were superfluous now to detain you with any detail on this subject. I will only add a brief statement of the very important observations made since his time by the Newton of comparative anatomy, the great Cuvier, concerning the harmony and necessary relations which subsist between the different members in each class of animals.

"Every organized individual," says this distinguished philosopher, "forms an entire system of its own, all the parts of which mutually correspond and concur to produce a certain definite purpose by reciprocal action, or by combining towards the same end. Hence none of those separate parts can change their forms, without a corresponding change in the other parts of the same animal; and consequently each of these parts taken separately indicates all the other parts to which it has belonged. Thus, if the viscera of an animal are so organized as only to be fitted for the digestion of recent flesh, it is also requisite that the jaws should be so constructed as to fit them for de-

forth his hand, and looking at the limbs of his body, said, 'Here the wisdom of God is displayed:—I have *hinges* from my toes to my fingers' ends. This finger has its *hinges*, and bends at my desire;—this arm, on its *hinge*, is extended at my will;—by means of these *hinges* my legs bear me where I wish;—and my mouth, by its *hinge*, masticates my food.—Does not all this display the wisdom of God?'"

How closely parallel is this to the argument in Paley, 8th chapter, on the Mechanical Arrangement of the Human Frame,—where he expatiates at length on the *hinge*-joint of the neck, on the *hinge*-joint at the elbow, on the *hinge*-joint at the knee, on that of the ankle, &c.—to these the term *ginglymus* is technically applied.

vouring prey: the claws must be constructed for seizing and tearing it to pieces; the teeth for cutting and dividing the flesh; the entire system of the limbs, or organs of motion, for pursuing and overtaking it; and the organs of sense, for discovering it at a distance. Nature also must have endowed the brain of the animal with instinct sufficient for concealing itself, and for laying plans to catch its necessary victims."

Did the time permit me to proceed with the detail of the examples which he subjoins, in these and the other classes, all would be found most striking.

Another most beautiful point in the organization of the various animal frames, is one which is almost suggested by the name *comparative* Anatomy, and which imparts to that science all its exactness; viz. the uniformity of the general type, according to which those animal frames are constructed, subject as that type yet is to a thousand different subordinate modifications, calculated to adapt each individual form for the peculiar circumstances under which its living occupant is placed. This uniformity in its greatest degree is of course to be found only in the different congenerous species of the same great orders of the animal kingdom,—in the several species of vertebrated animals, for instance: yet in these how great a diversity (in each case regulated by the specific wants of the animal) is found to coexist with a perfect identity in the general type of the structure. If we take, for instance, a man and a whale,—what can seem more diversified than the external forms of each; and how admirably do

those diversities fit each for its place, for the element in which it moves, and for the pursuits in which it is engaged? Yet if we compare the skeletons of each, the uniformity is such, that a person previously acquainted with human anatomy, would at once be able to point out, bone for bone, analogous divisions in the structure of the whale, with the exception indeed of the hinder extremities, which being in the whale unnecessary, are here left out of the design. But in the anterior extremities, though nothing can at first, and outwardly, seem more different than a man's arm and hand and the fin of a whale, both in figure and use, yet the anatomist will at once recognize in the skeleton of both, the same type and the same subordinate parts. The same humerus, though much shortened in the whale; the same radius and ulna, although the cetaceous forms are compressed and anchylosed to the neighbouring parts; and the same carpus and metacarpus, though with similar modifications, terminating in the same phalanges. Yet how admirably is each so diversified as to fit it for its intended purpose! How admirbaly does the human hand and arm co-operate with man's reason, with which in one sense this form seems co-ordinate, in all the arts which distinguish his mode of being! And how well suited is the whale's fin, as an organ of impulse and direction in its motion through the waves! This surprising uniformity has always seemed to me valuable, as inferring the unity of the designing intelligence; just as the adaptation of the diversities demonstrate his intelligence. An Italian anatomist has beauti-

fully expressed this varied uniformity in a Latin sentence, well worthy one of the descendants of Cicero's compatriots. "Usque adeo Natura una eadem semper atque multiplex, disparibus etiam formis effectus pares, admirabili quadam varietatum simplicitate conciliat."—(*Scarpa* de Auditu.)

But the most astonishing provision in the animal economy is perhaps the system of nervous influence, the great and sole channel of communication by which the impressions excited by external objects on the organs of sense are transmitted to the central seat of sensation, and by which inversely the energies of volition, stimulated by the ideas so presented, are propagated, and excite corresponding motions in every part of the muscular frame. While engaged in drawing up this article, my eye is caught by a statement on this subject by a most intelligent medical writer, so luminous and so concise that I cannot, I am sure, present that subject to you more clearly than by quoting his words.—Speaking of the nervous system, he thus proceeds to describe it as—

"A medium of communication every where distributed with the minutest care, and in the richest profusion; while its various parts and subordinate systems are so closely, so carefully, and so astonishingly connected with each other, as to indicate most clearly the perfection of divine wisdom displayed in preserving its uninterrupted and harmonious intercourse, and securing the most general impression. Not the minutest sensation occurs at the extremity of the system, but is instantaneously propagated to its centre: not a desire is excited in the mind, but a corresponding action is produced

in the organ destined for its gratification; and the endless variety of communication with its several regions, through the medium of plexus, ganglion, interlacing and decussation of fibres, separate twigs of intercourse, and the one agency of the great sympathetic nerve, is such as to overwhelm the mind with astonishment."*—*Newnham* on the Influence of the Mind on the Body, &c. *Christian Observer*, March 1831, p. 142.

ENTOMOLOGY.

Even in the minutest, (I will not say meanest races,—for which of the Creator's works can be called mean!)—in the history of the insect tribes, we often find some of the most astonishing proofs of that Creator's universal providence. A treatise on Entomology is trifling only in the size of its objects. When we examine the wonderful fabrics which many of them construct, and their admirable provisions for the care and sustenance of their young progeny, which the parents themselves are often destined never to behold,—we look with astonishment on a power of instinct which even reason is unable to fathom; and feel that in one sense at least it is philosophically true, that "Deus est animus brutorum."

I know not, indeed, any subject which more conspicuously displays the amazing riches of that

* On the subject of Zoology some very interesting remarks occur in the introductory treatise to the Library of Useful Knowledge, which I have been obligingly permitted to extract.—See Appendix, No. I. I would also particularly wish to refer to the excellent treatise on Animal Mechanics, published by Dr. Olinthus Gregory, in the same series. The Animal Physiology of the same series is likewise especially valuable.

creating and presiding Intelligence, the Author and Governor of nature, than the history of these minute tribes. The very fact of the small size of the objects only renders more admirable the very signal instances of contrivance and design which all the phænomena of their organization, their instincts, their arts, and their social order exhibit. We feel more, I think, the infinite extent of that care which is over all the great Creator's works,—which knows no distinction of great and small,—when we see it thus lavished on beings which to a superficial view appear so utterly insignificant; and in one instance perhaps we are warranted in carrying our inferences from design a step further in this case, than we are able to do in a mode of reasoning equally direct with regard to the higher orders of animals,—I mean with reference to the arts, *c. g.* architecture, &c., of these insects, which we see obviously as much provided for in the original design which has regulated their organization, as the primary physical wants of their nature; for we find peculiarities of organic structure as decidedly adapted to the one as to the other. I have before endeavoured to avail myself of this analogy, in pointing out the probability that a similar provision may have been made, though by a prospective anticipation, for the progressive advances of the arts developed by human reason. And indeed in the organic structure of man,—in the admirable and universally applicable instrument with which he is furnished in the human hand, we find a provision strictly co-ordinate with the mental powers which direct the application of that instrument.—But to return to

our insects. In the admirably disciplined societies of the ant and the bee, in the regular division of labour, &c., we see, as it were, a beautiful model of the best organized republics of civilized men ;—not only in the devotion of the community to the necessary safety of the queen and universal mother of the tribe, but in the divisions of the worker, from the nurse bee ;—divisions obviously the express appointment of the Author of Nature, because they are accompanied with corresponding varieties in the organic structure of the different classes. Then, how admirably is that organic structure adapted to all their wants ; not only their physical wants, for that provision we equally see in all animal races : and though the intestinal sacs for carrying honey in the bee, and the curious ovipositors of many insects are peculiar and beautiful examples, yet they belong to an universal class of animal provisions. But the provisions made for the uses of what may well be called the arts of insects, seem to me strictly *sui generis* ;—such, to take the most obvious instance, are the spinnerets with which the spider constructs its geometrical webs.—But the arts of bees are decidedly the most striking. In these wonderful little insects, instinct has taught them rules of construction of which man's reason examines and confirms the propriety by the most refined mathematical calculus. If we inquire by a problem in *maxima et minima* what figure will afford the greatest capacity in the least space and with the least expenditure of materials, we have as our result the precise hexagonal cells employed by these little geometricians. If we

inquire what ought to be the form of the pyramidal terminations of such cells where the bases of the double row of cells fronting the opposite faces of the comb are in contact in the middle, the infinitesimal calculus directs us to certain angles which should be employed in the formation of a three-sided pyramidal base, in order that the least possible quantity of matter may be expended, and these angles will be found the same within two seconds with those actually employed. To supply and use the materials for these admirable structures, we find them furnished with an organic apparatus by which wax is secreted from their vegetable nutriment, and deposited between the scales of the wax-workers. We find also their legs provided with a little triangular basket for the express purpose of carrying the propolis or vegetable gum, which they employ as a sort of cement and varnish. The hairy bristles of their legs fit them for brushing off and carrying heaps of the pollen of flowers, which in the form of bee-bread constitutes an essential part of their nutriment. The claws of their extremities and their flexible mandibles supply all the purposes of man's hand and fingers, and in a manner equally efficient: and their tongue, also capable of assuming the most varied shapes and executing the most complicated operations, being sometimes flattened like a trowel, and at others pointed like a pencil, is a most useful aid in their architecture*.

* On this subject, Kirby and Spence on Entomology is the most complete treatise: but the cheaper and more condensed publications on the subject, in Murray's Family Library, and The Library of Entertaining Knowledge, contain every thing at all essential, and are most ably executed.

VEGETABLE PHYSIOLOGY.

It may be regretted that Paley has not entered more largely on the physiology of vegetables, which would have afforded him many illustrations of his argument scarcely less interesting than those of the animal œconomy. The time will now only permit me to adduce one of these, which is particularly suggested by the present vernal season. Who can now pass through the fields without admiring the curious manner in which the tender petals are enfolded, and defended from the still frosty breezes in the cases of their yet unexpanded buds. All of you must frequently have admired the exquisite specimens of this presented by the horse-chestnut;—the external scaly cases of its bud covered with a thick gum, forming so complete a shelter for the inclosed leaflets from the action of cold. But few of you are probably aware, that these external scales present a most beautiful instance of one of those prospective provisions, affording by anticipation an adaptation of organization, varying with the varying circumstances to which the subject may be exposed. These scales are derived from the same origin as the ordinary leaves; and in the warm climates of which the tree is a native, are fully developed under their form, as common additional leaves: but when transferred to our colder regions, these outer leaves are chilled, checked in their growth, and instead of expanding in the natural form, they contract, harden, curve inwards, and degenerate into scales, beneath whose friendly covering the protected interior leaflets vegetate freely. Thus is the very cold made by its influence to produce

an effectual defence against the injuries it might itself otherwise occasion*.

CONCLUSION.

Thus feebly have I endeavoured to set forth and illustrate the most striking and convincing argument which the great Creator has addressed to his rational creatures, in thus plainly inscribing the fundamental truth of his existence on all his works. But the force of the argument may be perhaps best exemplified, by observing the concessions which it extorts from those unhappy men who would fain endeavour to persuade themselves in their hearts, that there is no God. One of the ablest of these, Diderot, frankly admits, that it was necessary, in consistency with his view of the argument, to maintain that it was possible that the most elaborate Epic, an Iliad for instance, might be reproduced by rattling together a number of types like dice, and throwing them a sufficient number of times; and this absurdity he does consequently seriously maintain. "Whatever," say we, "were the finite sum of types with which it should be proposed to me to reproduce the Iliad, there would be an appreciable finite sum of throws, which would render the proposal advantageous for me. And if the number of throws allowed me were infinite, my advantage also would be infinite." Surely we may safely enough take the philosopher at his own words, and admit the pro-

* I would especially recommend the admirable and compendious work of Mrs. Marcet on Vegetable Physiology. I may also refer to my friend Mr. Duncan's interesting essay, entitled Botano-Theology.

bability that the universe could come into existence without an intelligent Creator, and that an Iliad could be thus constructed, are exactly equal. But even Diderot himself seems, as an amiable writer has observed, "to have had some lucid intervals in which he thought and felt very differently." In one of these happier moments he has exclaimed, not more eloquently than justly, "Is not the existence of a God as clearly impressed on the eye of a moth, or the wing of any insect, as the faculty of thought in the writings of the great Newton? What! Does the formation of the universe evince less of intelligence than the explanation of the universe? What an assertion! Is not the intelligence of the First Cause more forcibly demonstrated by his works, than the faculty of thought in a philosopher by his writings? Let the Atheist, too, remember that I have objected to him only the wing of a butterfly, whereas I might have crushed him with the weight of the universe."

May the applications of science which I have thus endeavoured to inculcate, become habitually familiar to your minds, and heighten and sanctify the intellectual gratification they are calculated to yield. Without such an application, indeed, what can they ultimately profit? Horace, in his most beautiful Ode on the Death of the Philosopher Archytas, gives a melancholy answer to this question.

> ". . . . Nec quidquam tibi prodest
> Aërias tentasse domos, animoque rotundum
> Percurrisse polum, morituro."

But with such an application, when these pursuits

are cultivated with a constant reference to the great Creator, and when through them we endeavour to habituate our minds to the contemplation of his power and goodness,—may we not trust, with a better hope, that such a study may be productive of advantages, which shall not thus desert us at the hour of death?

I will now conclude with the words in which the great Newton sums up his celebrated *Scholium generale* at the end of his immortal *Principia*. "Atque hæc de Deo, de quo utique ex Phænomenis disserere ad Philosophiam Naturalem pertinet."

PART III.

ARGUMENT FROM ANALOGY, AND ON THE PECULIAR EVIDENCES AND DOCTRINAL CHARACTER OF THE CHRISTIAN REVELATION.

THE preliminary consideration of the natural evidences to the existence of an intelligent Creator of the universe, as deducible from the innumerable marks of design impressed on the works of creation, has been properly followed up in the plan sketched for your lectures, by the examination of the argument drawn from the analogy of religion, natural and revealed, to the constitution and course of nature; a subject, as is well known, identified, as it were, with the name of that distinguished author who first handled it fully and satisfactorily; a name which, in this place, should, I think, be peculiarly cherished, as that of the ablest Prelate who has presided over the See of Bristol. In the progress of the course, this work will be regularly perused by the present class.

A slight sketch will be sufficient to show the general tenor of Butler's reasoning. He first prepares his ground by pointing out, in the general constitution of the circumstances amid which we are placed, the traces and indications of a natural government of his creatures by the Deity; the further marks of a moral character belonging to his government; the presumptions hence arising of a future state, in which that moral government shall be extended and perfected; and the suit-

ableness of our present state, as a stage of probation, to educate and discipline and prepare our souls for another and advanced scale of being,—are then exhibited. Having thus laid the foundation, he proceeds to the necessity and importance of Revelation, as a clear and authoritative republication of the truths of Natural Religion, which before were obscured by doubt, and destitute of any adequate sanction; and still more as an original communication of truths not discoverable by natural reason; of the alienation of our state by nature; and of the dispensation for the recovery of lost man, by the atonement effected by the Son of God, and by the renewing influences of the Spirit of God,—he shows that we cannot doubt that the doctrines of such a Revelation (if there be sufficient evidence that such has been vouchsafed) must impose upon us duties no less obligatory than those most clearly pointed out by the light of nature. He then proceeds to show, that the difficulties which Christianity presents,—such as arise from its partial and limited diffusion*, and

* Butler's answer to the objection against Revelation, drawn from its want of universality, where he alludes to the analogous cases in God's natural government of the world, in which we often see his gifts bestowed with the same apparent partiality, will, I think, derive a peculiarly appropriate additional illustration, if we compare the manner in which he has been pleased to impart the knowledge of the remedies which are curative of the physical disorders to which our corporeal frames are subject, with the manner in which he hath regulated his communication of the religious remedial dispensations applicable to the spiritual disorders of our moral constitutions; in each case (and I do not think we can select any two cases more properly analogous) such knowledge hath been imparted gradually, progressively and partially. How

the supposed deficiency of its proof,—are objections which might be urged with equal force against all that we are most clearly assured of in God's natural government of the universe; that the page of Nature is a page of mystery, no less than that of Revelation, and that the presumptions from analogy are, throughout, rather favourable than hostile to the Christian scheme, whether considered in its doctrines or its evidences. Especially he argues, that what he justly considers as the fundamental truth of the particular system of Christianity, the appointment of a Mediator, and the redemption of the world by him; far as they transcend the discoveries of natural reason, are

long and widely had fevers afflicted the human race, while yet one remote nation alone possessed the invaluable specific contained in the bark of the Peruvian Cinchona, which was hid from the far greater portion of mankind till less than four centuries ago; and even when at length made known, how imperfect and inefficient was its application until very recently chemistry has taught us how to extract in a separate state the specific constituent in which the febrifuge principle resides,—a discovery which has already so far mitigated the symptoms of disease, that districts before almost uninhabitable from the effects of malaria, are acquiring the happy character of a new salubriousness. How long had the inhabitants of the lovely Alpine valleys suffered from one of the most cruel deformities, before the efficacy of iodine was discovered? How many children fell premature victims to variolar disease before inoculation mitigated, and subsequently vaccination almost promises to expel this pest of infancy? Now, in all these cases, it must either be contended on the one hand, that neither the remedial or preventive virtues of these specifics, nor the faculties which enabled men to discover them, were the gift of a moral governor of the world, because they have been thus partially distributed; or on the other, it must be allowed that similar objections against Christianity as a divine revelation have no validity.

yet in no manner inconsistent with them. To abridge these arguments exhibited in the original with remarkable condensation of reasoning, would now be alike superfluous and injurious, as I trust you will shortly examine for yourselves the details of that admirable original. I can only hope that my own views, when my present survey shall conduct our glance over any of the particular topics thus alluded to, may be found imbued with some portion of the spirit derived from this source. And it shall, in the first place, be my endeavour in this spirit (although without servile plagiarism) to point out the just line of connecting argument by which we may advance from the Natural Evidences of Theology, which it was the business of my former Address to exhibit to you, to the consideration of the peculiar evidences and doctrinal character of the Christian Revelation,—the subject to which I have next to call your attention.

We have already seen that all nature implies design, that the constitution of every thing which the universe contains is exactly adjusted and adapted to its situation, and to the relations which intervene between itself and surrounding objects. We have seen, I say, that this physical adjustment of things is universal and complete; but are we not bound on every principle of analogy to extend this argument from design still further? for surely we cannot reasonably limit it to a partial application. If, for example, there should be in existence any beings of a mixed nature, possessing intellectual and moral, as well as physical constitutions; on what possible ground of reason can we persuade ourselves that the principle of adjust-

ment and adaptation which we find universally manifested in their physical properties, is wanting in their moral properties? Now such a mixed being is man: And how can we for a moment suppose that all the circumstances belonging to the inferior part of his nature being thus strictly regulated and exquisitely adjusted by final causes, those of the superior part of his nature are not so regulated? Let us look for a moment at the analogies presented by the instincts of the lower races of animals; let us contemplate the singular and admirably organized societies of many insect tribes of the bee and of the ant: in these the physical preservation of the species is evidently as much dependent on instincts, which it can hardly be considered as any abuse of language to term moral instincts, as on any purely physical circumstances. Here then we see a physical end requiring for its attainment intellectual and moral, no less than physical qualities; and we perceive both conditions equally fitted to attain that end. How then can we here suppose that one half, and that the lowest half, of the provision has been regulated by a design emanating from the great Creator's mind; while we refuse to acknowledge this of the other, and certainly higher half of the very same provision? But if we admit this as to the instinct of insects, how can we doubt of it with regard to the reason of man? The intellectual qualities on which the social relations of man depend, are indeed more varied and complicated than the instincts which regulate insect societies: but it may, I think, fairly be presumed that they differ rather in degree than in kind. And can it be said that this

difference in degree renders it probable that the lower objects are regulated by the Divine Mind, but that the higher objects are not so regulated? The general prevalence, I had almost said the *universality*, of these moral feelings,—for their liability to perversion, under circumstances unfavourable to their development, is surely not a more urgent exception than the diseased perversions of our vision, our taste, and our other physical senses,—the universality then, I will say, of these moral feelings surely imparts to them an instinctive character. I am well indeed aware of the objections sometimes alleged against the possibility of such moral instincts, because it is urged that they involve the exploded doctrine of innate ideas: but I will venture to confess that I have never been able to perceive the relevancy of this objection. Surely the supposition, that the mind possesses instinctively a moral *constitution*, disposing it to regard certain objects with approbation, and others with disapprobation, no more involves the assumption that the mind possesses innate ideas of those objects, than the certain fact that the physical senses are so constituted as to be affected pleasurably or painfully by different objects, involves the assumption that those senses must possess innate ideas of the sounds, colours, and flavours, &c. which so affect them. Are not then, I would ask, these universal, and, as I believe, instinctive feelings, of a strictly moral character? Are they not such as, being implanted in our breasts by the great Governor of Nature, prove that his government is of a moral character; and in effect assist in carrying that government into execution, by the rewards which they minister to

the virtuous bosom, and the punishments which they inflict on the guilty, as it were, by a necessity of nature? Does not universal sympathy agree with the poet when he exclaims—

> " What nothing earthly gives or can destroy,
> The soul's calm sunshine and the heartfelt joy,
> Is Virtue's prize."

And again, when the opposite picture is drawn by the classical satirist,

> " Nec tamen hos tu
> Evasisse putes, diri quos conscia facti
> Mens habet attonitos, et surdo verbere cædit,
> Occultum quatiente animo tortore flagellum."

Do not then these indications of an actual moral government, and of a system of moral retribution carried even at present, however partially, into effect, afford some ground of presumption, that there may be a yet fuller development of this moral government, a yet stricter system of retribution in some future and more advanced stage of being, if indeed such a future state be itself probable? To what conclusion then, on this latter head, does analogical reasoning conduct us? Is not every presumption it affords favourable to the notion of successive and advanced stages of being? Is not the life of the fœtus introductory to that of the infant, and that of the infant to that of the man? and why may there not remain yet one other stage? The beautiful classical emblem of the soul, the butterfly of Psyche, is surely not less philosophical than poetical: for would it not, *à priori*, be at least as improbable that the caterpillar should survive its apparent dissolution and give birth to a being so essentially different, as that the soul of

man should so survive, and when divested of its present corporeal investiture assume some new form adapted to a higher mode of existence?

If then there should exist any degree of *probable presumption* that these things *may* be so, that interests so all-important to man *may* possibly be depending, as must be presented by the prospects of a future state of existence, and by the inquiry whether any mode of preparation in this life may be practicable or requisite to qualify the soul for that future state; if, I say, points so awfully momentous be depending, can we hesitate to perceive the importance of a divine revelation to clear them up? Can we hesitate to agree with the philosopher of old, in the wish, which I have already quoted in my first address, for some divine communication on this great subject, upon which we might confidently embark our all, as in the only vessel fitted to convey us in safety through the perils of our course? For while the general apprehension of man, what Cicero calls the "omnium consensus naturæ vox," always testifies that the soul is permanent, and that something still remains beyond the grave*, nevertheless impenetrable clouds and thick darkness hang over the subject: thus we find the same Cicero, after enumerating the many absurd and contradictory opinions of the philosophical schools as to the nature of the soul, subjoining, "harum sententiarum quæ vera sit Deus aliquis viderit, quæ verisimillima magna quæstio." Aristotle peremptorily denies immortality: "Death," saith he, "is the limit, and it seemeth that nothing either of good or evil

* Tusc. Quæst. lib. i. §. 15.

can affect the dead (Ethic. lib. 3.). And even those who were most inclined to entertain the hope that death was not thus final, could advance no further than Seneca : "Juvabat de æternitate animarum quærere, immo mehercule *credere*. Credebam enim sine opinionibus magnorum virorum rem gratissimam promittentium magis quam probantium." Is not such a state of things then truly a *dignus vindice nodus?* Is it not a crisis which might naturally be supposed to claim the interference of the great Author of our natures, who hath constituted them susceptible of such earnest aspirations, of such anxious apprehensions ? Was not a Revelation needed to bring life and immortality to light? Nor was it less necessary on almost every other subject of natural theology and moral obligation. Those who are most intimately acquainted with all the bearings of the previous speculations of unassisted reason, will ever be the first to assent to the convincing reasoning of one of the earliest apologists of the Christian Revelation. "Your systems of virtue," saith Tertullian*, "are but the conjectures of human philosophy, and the power which commands obedience merely human : so that neither the rule nor the power is indisputable, and hence the one is too imperfect to instruct us fully, and the other too weak to command us effectually : but both these are abundantly provided for by a Revelation from God. Where is the philosopher who can so clearly demonstrate the true good, as to fix the notion beyond dispute? and what human power is able to reach the conscience and bring

* Tertullian. Apol. c. 45.

down that notion into practice? Human wisdom is as liable to error as human power is to contempt*."

So that even if we were to consider Revelation only as an authoritative republication of the truths of Natural Religion, substituting the indisputable sanction of a divine teacher for the doubtful speculations of conflicting human schools, it would still be a communication of the first necessity and importance; and should any probable pretension to such a Revelation be made, the evidence adduced in its support must undoubtedly challenge our deepest and most serious attention. But still further, if such an asserted Revelation should be found to contain, not only this republication of natural truth, but also many doctrines purporting to be of the greatest importance, totally undiscoverable by natural reason, though by no means contradictory to it,—then, since, if such Revela-

* The conclusion of Cicero's Dialogue De Natura Deorum well illustrates the entire uncertainty that must necessarily prevail on doctrines professing to rest on no higher authority than the arguments of conflicting philosophical schools. In this dialogue, Balbus the Stoic has been introduced as alleging the usual philosophical arguments in proof of the existence of the gods: and Cotta, the new Academic, while, himself bearing the rank of Pontifex, he professes an implicit submission to the rules of the priestly college, (obviously only, as is allowed in a following dialogue De Divinatione, *ne communi jure migrare videatur*), yet refutes all these arguments most elaborately, so that *studio contra Stoicos disserendi deos videtur fanditus tollere*, and attacks with all his force the *whole doctrine of Providence*; and what is the conclusion? "Hæc cum essent dicta, ita discessimus, ut Velleio Cottæ disputatio verior, mihi Balbi ad veritatis similitudinem videretur esse propensior."

tion be established as true, these, its *peculiar* doctrines, must necessarily impose obligations upon us, no less binding than those resulting from any natural truths ; and since Revelation affords to us the *only* channel of ascertaining these, the duty incumbent on us to examine into the evidence on which it rests, clearly forms the first and most indispensable of all duties, inasmuch as it is necessary to elucidate the very foundation upon which the obligation of every other duty relies.

What then are the peculiar evidences of the Christian Revelation?

The appropriate evidence of Revelation must ever ultimately resolve itself into miraculous agency. If it be asserted that the Deity hath spoken, we require proofs that the intervention hath been really his ; but what proof of his intervention can be given save the performance of some action of which he alone is capable? But all actions of this nature are in effect miracles. Our primary notion of the Deity being that of the Author of Nature and its laws, we necessarily believe that he, and he only, is competent to suspend or modify those laws. Prophecy may indeed be added as another class of appropriate evidence ; but it must, I think, be esteemed subsidiary to miracle, its application being far more difficult and complicated. Christianity however purports to be confirmed by both these classes of evidence ; and we shall presently examine how far that pretension can be satisfactorily maintained. What is called the internal evidence, arising from the excellency of the doctrines, and their adaptation to the wants of human nature, must be considered,

I think, rather as affording a favourable presumption (often indeed a very strong one) that they have truly proceeded from that all-wise Being who alone knoweth what is in man, than as constituting direct evidence. To this point, however, we shall return. But first, as to miraculous evidence. Some sceptical writers have endeavoured to argue against every ground of believing in such. We believe human testimony, say they, only on the analogy of experience, and that analogy of experience is much stronger against any deviation from the laws of nature than it is in favour of such testimony. To this objection it has been well answered, that the same analogy of experience would equally justify a king of Siam in rejecting as incredible the testimony of any traveller, who should inform him of the congelation of water into ice. On the same principle the scepticism of Herodotus must be perfectly philosophical, when, after relating the observation of the Phœnician mariners, who circumnavigated the southern extremity of Africa, that in this operation they had the meridian sun on the north, he adds, "Any body else may believe this, but to me it is perfectly incredible." Still Nature, as we have formerly seen, attests that all her laws were originally imposed by an intelligent cause; and can we doubt that he who imposed has power to suspend or modify them? One branch of natural science moreover—Geology, affords us proofs, as we saw in our last Address, that he has subsequently interfered with those laws, by an event no less striking than the calling the race of man into existence, to inhabit the face of a planet at first uniformly covered by the deep. A late writer in

a popular journal has well remarked on the application of the argument hence resulting:—"This discovery imposes a still further degree of unreasonableness on the supporters of the uniformity of causation in its ill-extended sense and application: the circumstances of the remarkable evidence thus wonderfully brought to light seem to leave the recusants only this alternative; either out of compliment to a refinement of metaphysical ingenuity, they must, in spite of the concurrent testimony of philosophers, disbelieve the fact that the prior state of nature was broken in upon to make room for man; or, in case an interruption, that is a miracle, be admitted to have taken place in this instance, they must take for granted (and this without any satisfactory distinction being suggested) that it cannot be repeated, or, if repeated, must not be believed*."

Miracles then being the appropriate evidence of Revelation, and the objections made against the reception of human testimony to establish these miracles being removed, our next step must be to inquire what circumstances render testimony competent to such an application, and whether these circumstances be present in the evidence of Christianity.

Now, the competency of testimony to establish miraculous facts must evidently depend on exactly the same circumstances as its competency to establish any other facts, though undoubtedly in this case the evidence may reasonably be subjected to a scrutiny of more than ordinary severity. These circumstances resolve themselves into the inquiry,

* Edinburgh Review, No. 114.

1st, Whether the witnesses could possibly have been deceived themselves as to the facts of which they give evidence. 2dly, Whether they lay under any conceivable temptation or inducement to falsify their testimony so as to deceive others.

How then stands the evidence adduced in support of the Christian miracles in these respects?

That evidence purports to consist of the testimony of witnesses, themselves, in part at least, the associates of the founder of that religion, and the spectators of the miracles which he wrought in proof of his divine mission,—miracles, such as the raising the dead, the giving sight to those known to have been born blind, the cure of organic diseases, and the like,—concerning which no deception could be practicable, the only alternative being that the narrative must be false, or the miracle true. Deceived themselves, therefore, the witnesses could not possibly be; more especially as they speak of the power of working miracles as imparted to, and continuing with, themselves and their companions, as the apostles and authoritative teachers of the new faith. Our next inquiry then must be, What temptation then can we suppose to have existed to induce them to attempt to deceive others? What interested motives appear to have actuated them? Now they profess themselves to have been exposed to the bitterest persecutions, to imprisonments, scourges, and death, as the inevitable consequences of persisting in their testimony. They profess that "if in this life only they had hope, then were they of all men most miserable." What inducement then could have tempted them to fabricate such a testimony?

Every worldly interest must have been most vehemently opposed to their ever having uttered it; and the interests of another world can assuredly afford no encouragement to falsehood. But it will be observed that I have hitherto carefully said the witnesses *purport* to be such parties, and *profess* to have been under such circumstances; and here a distinction presents itself between living and documentary evidence. Had we lived at the time and received this evidence orally, and had we been ourselves cognisant of the circumstances under which the witnesses who saw it were placed, this had been fully sufficient; but in documentary evidence, it must be first necessary that we establish the genuineness of the documents, i. e. that they really did proceed from the witnesses whose testimony they purport to record, before we can advance to the examination of their authenticity, i. e. the truth of the facts recorded. We must also learn from extraneous and collateral sources, and such as we cannot conceive to have been implicated in any conspiracy of fraud, the circumstances under which the witnesses were placed. Let us examine then whether there be any deficiency of this extraneous and collateral evidence in support of the Christian documents :—First, with regard to the genuineness of these documents, it must of course require for its support the same critical evidence as the genuineness of any other writings. Now this critical evidence must be partly external, afforded by a regular series of successive reference to, and quotations from, them, given in independent authors from the age when they purport to have been first published. And we shall find that

this evidence is far more complete with regard to the Christian writings than with regard to any others, as might have naturally been anticipated from the more general interest belonging to them, and their consequently more extensive circulation. Thus we find the whole canon, as it is called, of the New Testament cited before the close of the second century of our æra*: and early in that century, in the writings of Justin Martyr, we find the Memorials of the Apostles repeatedly and familiarly cited, which, if they were not identically the same with the present Gospels, but as it has been sometimes imagined (though I think without any sufficient grounds), were some earlier document previous to the compilation of our separate Gospels in their exact present form; yet, however this may have been, the citations exhibit throughout the most close agreement with those Gospels, and sufficiently prove that the narrative cannot have been materially altered since that period.

What may be called the internal critical evidence (a phrase which I employ for the sake of distinction from the internal doctrinal evidence, which belongs to quite another part of the subject), consists in the agreement of the narrative with the

* In 1740 a MS. of the second century was discovered by Muratori in the Ambrosian Library at Milan, apparently a fragment of a dialogue of one Caius, cited by Eusebius and Jerome. This MS. contains a regular list of the books of the New Testament as they at present stand, with the omission only of the Epistle to the Hebrews, and of one of those of John, to whom only two are ascribed: the one passed over is probably the second. It has been published, with full critical remarks, in the beginning of the 4th volume of Routh's Reliquiæ Sacræ.

known historical circumstances of the time in which it purports to have been written; and if there be more narrations than one, as in the case of the Four Gospels—in what has been called their undesigned coincidences, that is, their agreement in minute circumstances, of a nature never likely to have attracted the notice of a forger, and which can scarcely be accounted for otherwise than by ascribing it to the harmony which truth must ever impress on all its records. Now the application of such an inquiry is in effect subjecting the documents to which it relates to the strictest cross-examination; and to such a cross-examination the evidence of Christianity has been subjected, and the result has been most satisfactory. There does not perhaps exist a more acute specimen of this kind of examination than the Horæ Paulinæ of the celebrated Paley, the object of which is the investigation of the undesigned coincidences in the personal allusions, contained in the different Pauline epistles, and in the narrative of the Acts, a treatise to which I would most earnestly call your deepest attention. It is I think quite impossible for any candid mind to arise from its perusal without a full conviction of the genuineness of this most important part of the Christian writings. A similar scrutiny has been more recently extended to the Gospels*, and the result, though perhaps less striking, has yet been most satisfactory. Of

* See an admirable article in the Quarterly Review for February 1831. As I am most anxious to place this very able investigation of the above subject in the hands of the present Class, I have (with permission) subjoined the most material extracts in the Appendix, No. II.

the genuineness of these writings then, and that they were really put forth, as they profess to have been, by the early disciples of Christianity, within the first century after the promulgation of that faith, we have the fullest evidence which the nature of the case admits, much fuller, probably, than can be brought to bear on the genuineness of any other class of writings.

It remains to be seen what we can ascertain as to the circumstances under which the witnesses, whose record is thus preserved, delivered their testimony, and how far those circumstances were calculated to shake or to confirm our reliance upon it. For this purpose we must of course endeavour to ascertain these circumstances from the independent evidence of other writers in no wise connected with them, and therefore entirely free from all suspicion of collusion or possible union with them in any confederate conspiracy. Now we have exactly such collateral evidence as we require, in the classical historians and other writers of the period, who looked upon this new and foreign sect, if not with hostility, yet with the indifference of supercilious contempt. From these sources we derive repeated and unsuspected corroborations of the fact that the early Christians attested with inflexible constancy a narrative of a miraculous character concerning the author of their faith, and that this attestation actually did draw down upon them all the extremities of persecution which we have before collected from their own account, which is thus far therefore unexceptionably confirmed. We have such collateral evidence in Suetonius, who flourished

about 70 years after the Crucifixion, who informs us that Claudius, who died within 20 years of that event, banished from Rome the Christians, whom the historian ignorantly describes as a Jewish sect raising continual tumults, "impulsore Christo."—Again, Tacitus, a contemporary of Suetonius, speaking of the fire which occurred at Rome in the time of Nero, about 10 years later than the time to which the former extract relates, informs us, that in order to avert from himself the suspicion of having caused the conflagration, he laid the guilt, and inflicted the most cruel punishments upon the Christians, a sect abhorred by the people as criminals, and deriving their name from Christ, who suffered death in the reign of Tiberius, under his procurator Pontius Pilate. "Their sufferings," he adds, "at their execution were aggravated by insult and mockery; for some were disguised in the skins of wild beasts and worried to death by dogs,—some were crucified,—and others were wrapped in pitched shirts and set on fire when the day closed, that they might serve as lights to illuminate the night." We have further evidence from another writer of the same age, whose account, however, carries us still lower down than the preceding, as it relates not to former reigns, but to his own time. Pliny, who was pro-consul of Asia Minor under Trajan, has left a letter, written by him to that Emperor, requesting his advice how he should act in repressing the Christians, whom he describes as amounting, in Bithynia and Pontus, to a great multitude of all ages and of both sexes, spread not only through cities but over villages and the whole country. "Many,"

he says, " had been apprehended, of whom some boldly avowed their profession and died in the cause, while others recanted." Several other passages to the same effect, from other heathen testimonies, may be found in Lardner and Paley.

On the evidence from Prophecy I can offer but few remarks in so general and cursory a survey, as my present Address—introductory be it remembered only—will admit. This subject is far less susceptible of any general statement, as it immediately resolves itself into the detail of the application and fulfilment of each particular prophecy. Since also these prophecies were not intended so far to interfere with the course of events, as to enable others to foretell them beforehand, they were often necessarily, at first, delivered under the veil of figure and allegory, and awaited their explanation until their fulfilment, and until History, their interpreter, assisted the investigation with its torch. The complication thus introduced into the subject must be obvious. I will only then briefly observe, that the Scriptures of the Old Testament present us with many distinct prophecies of the long-expected Messiah. The time of his advent, the place of his birth ; his miracles, his ministry, and his course of life ; his character, and the manner and object of his atoning sacrifice, are all foretold. I need only particularise that most affecting prediction in the fifty-third of Isaiah, of the unmerited sufferings of him " who was wounded for our transgressions, and upon whom was the chastisement of our peace;"—a passage, as is well known, mainly instrumental in the conversion of the unhappy infidel, Rochester. We

also find in the sacred volume many other striking prophecies of the successive monarchies of the ancient world, of the destruction of Jerusalem, of the dispersion of the Jews, and of the fate of the land of Judea and the circumjacent countries. But on all these points, and more especially on the last, I would refer you to the excellent little volume of Keith on the Evidence of Prophecy. He has often gleaned from the pages of travellers of indifferent or even sceptical principles, an unwitting, and, we may almost say, reluctant testimony to the exact fulfilment of those Scriptures, which they hesitated to admit, in the actual condition of the countries through which they passed. I would more especially call your attention to the accounts extracted from Volney of the districts of Edom or Idumæa.

The evidence arising from the consideration of the Christian doctrines, their excellency, originality, and suitableness to all the moral wants of our nature, or the internal doctrinal evidence, will be best illustrated while we are engaged in surveying these doctrines; and I shall now, therefore, offer a few concluding remarks on the peculiar doctrinal character of Christianity, introductory to the detailed examination of this most important subject, which it is proposed should engage our attention at my future visit to close the present Course.

Christianity, I would first observe, offers itself to us as a remedial dispensation for the recovery of man, who is uniformly represented to us, in its sacred writings, as in a state of natural corruption, and alienation from God. The remedial means

held out, are, 1st, The atonement of a *divine* Mediator; and, 2dly, The renewing and sanctifying influences of a *divine* spirit on the soul.

I feel that I naturally glide as it were into this subject from that of Prophecy, which has immediately preceded it; for such is the uniformity of the divine scheme, that whether it is foretold, announced as present, or recorded as accomplished, it is invariably described in terms strictly equivalent. Doth Isaiah in the passage I was even now quoting foresee the day of Christ? His exclamation is, "All we like sheep have gone astray, and the Lord hath laid on him the iniquity of us all." Doth his Baptist messenger proclaim his advent? "Behold the Lamb of God that taketh away the sins of the world!" Or is the most active apostle of his faith proclaiming its glad tidings to the Gentiles? What are his words? "God commendeth his love towards us, in that *while we were yet sinners Christ died for us;* much more then being now justified by his blood, we shall be saved from wrath through him. For if *when we were enemies* we were reconciled to God, *by the death of his Son*, much more being reconciled we shall be saved by his life." Can language be more explicit? To its simple and grammatical interpretation the Church of which I am an unworthy member has ever fondly clung as to the rock on which she is built. In this interpretation we would most anxiously seek peace to our own souls, and this, as the great secret of hope and restoration, would we most earnestly impress on all that will listen to our voice.

But who is the great Mediator thus proposed to us? Who is he that hath wrought out for us this great salvation? This inquiry must evidently be one of the greatest moment; for what can be more important for us than to ascertain what are the relations in which the author of that salvation stands to those to whom it is offered? and what the duties which in virtue of those relations he claims from us? For an answer we can refer alone to the word and to the testimony which he hath bequeathed to his Church. It alone appertaineth to us simply to record the express declarations of that testimony. In this then we find him described as the Son of God, emphatically, and with every epithet which can mark the application of that title in a special sense as the only begotten, the well-beloved. We learn that earth was not his original place, but that he descended thither from an heavenly seat, that when he took upon himself the servile form of man he emptied himself (εκενωσε εαυτον) of his proper and previous dignity. Therefore that human condition can never have been his essential nature. We read that this his preexisting state was one of glory with the Father before the world was, or, as it is yet more explicitly spoken, that he was in the beginning with God and was God; that all things were made by him, and without him was not any thing made that was made; for by him were all things created that are in heaven and that are in earth, visible and invisible. All things were created by him and for him, and he is before all things, and by him all things consist. He upholdeth all

things by the word of his power*. Hence an Apostle scruples not to address him as his Lord and his God; and the first martyr who sealed with his blood the confession of his faith while on the eve of falling asleep in him, offers up to him the most solemn prayer which man can possibly address to Deity, "Lord Jesus, receive my spirit."

These doctrines cannot be even glanced at without its being at once perceived that they are perfectly original. So little are they discoverable by natural reason, that at first sight they might rather appear repugnant, although on more careful investigation we shall I trust be led to the conclusion that no real opposition exists: that on the contrary these doctrines explain appearances which are and always have been universal throughout the world; that they are exquisitely adapted to the moral circumstances under which our nature is placed; and afford the only adequate supply to the moral necessities of that nature; and can alone hold out to the earnest aspirations of our souls the soothing promise that in embracing them they shall find satisfaction and repose. Yet so truly original are these doctrines, that that originality has been ably urged† as affording an argument (and a very powerful argument it is) that impostors could never have devised with the smallest probability of success, doctrines so unlikely to meet with acceptance amongst any whom they addressed,—doctrines which to the prejudiced Jew were a stumbling block, and to the philosophical

* Compare the 1st chapter of St. John's Gospel and the 1st chapter of the Epistle to the Colossians.

† See particularly Sumner on the Evidence of Christianity.

Greek, foolishness. Such a system, it is forcibly argued, could never have triumphed as it did, had not the power of God indeed worked with it.

Fully to unfold to the class now for a time entrusted to my care these most important doctrines, will hereafter be my gratifying task; and my earnest prayer will be, that, however feebly, it may yet not altogether unprofitably be discharged. May I be enabled to give a reason of the hope and the faith which we place in them, in the spirit so solemnly inculcated of meekness and fear; fear of unnecessary offence, fear of unfaithful compromise by suppressing any portion of essential truth committed to our charge, and fear of injuring its simplicity by the intermixture of any presumptuous explanations of our own beyond that which is written! I will now only observe on this subject, that the single question before us must ever be "What is written?"—the only reasonable place for objection must be while inquiring into the evidence of Revelation. If this evidence be satisfactory, no objection can possibly lie against any of the contents of that Revelation; these must be implicitly and submissively received. We may not dare to pursue a partial course,—to embrace the portions we approve, and reject those we disapprove. We may not dare to modify and pare down the doctrines of a credited Revelation to make them suit any preconceived hypothesis of human reason. The only question, I repeat, must ever be, "Hath God indeed spoken?" If he hath, shall he not say to every whisper of doubt—

Be still, and know that I am God!

Is this then contrary to reason?—far, my friends,

far from it: it will ever be my endeavour to place in its just light the real union of Reason and Faith. Faith hath indeed sometimes been contrasted with Reason, as if these two principles (both the gifts of the Author of all light) were or could be, when rightly understood, in opposition the one to the other; but they are in truth inseparably combined,—Reason is the handmaid of Faith, and Faith is the perfection of Reason. Them hath God joined together, and let no man presume to put them asunder, either by exalting unassisted Reason, or by stripping Religion of her aid and attendance. If we examine the objects of religious truth, we shall find that the faculty which gives them admission into our souls, is Reason. Sense and Reason are the two eyes of the mind; and while material objects appeal to Sense, spiritual objects appeal to Reason; she is the porteress, as it were, sitting at the gate of the soul to receive and usher them in. I do not mean that she first suggests them; that is the higher office of that great Power, the primary source of all illumination, who created her for this among other purposes. But I assert, that she does and must first entertain them; the leading idea of the existence of a Deity is in the first place recognized and received by her; and the other elementary truths of religion follow in their order. These truths are indeed so impressed by her Maker on her essence, that even when his more direct voice is silent, she still repeats them—faintly and feebly indeed, and languishing as cut off from the source and cause of her knowledge;—but still she does repeat them, and she loves to trace them in the

beauty, order, and harmony of the universe. When his more direct voice is heard,—when Revelation speaks, it is indeed her place and office to sit silent and listen, and with all other creatures to keep peace before her Creator, receiving humbly truth from him who is the one great Eternal Truth. But this her submission is not forced or constrained; her prostration is a voluntary prostration; it is a duty which she teaches and enforces on herself. There is indeed a proud and rebellious principle, a miscalled and spurious reason, more justly termed—as being often mistaken for her heavenly prototype—the wisdom of this world, which acts otherwise: but to confound the two, even in name, is alike injurious to the cause of true religion and true reason. Submitting herself thus readily and entirely to revelation, it is therefore to true reason that revelation appeals, calling on her to reject every false pretension to that title, and to admit, approve, and attest the true. When the beautiful feet of them that preach the Gospel of Peace wander afar amidst the nations that sit in darkness and in the shadow of death,—is not their mighty errand, the mission of reason, as well as of religion? Does not reason furnish them from her armoury with the keen weapons which must expose the abominations of Juggernaut, the follies of Brahminical superstition, and the fallacies of Mahometan imposture? and must not these weapons be first successfully employed to clear the way for the more appropriate use of the sword of the Spirit, the Word of God? Are not the disciples of Christianity, from the beginning, instructed to be ever ready to give a *reason* for the hope that is in

them? I have said, that as Reason is thus the handmaid of Faith, so is Faith the perfection of Reason. The object of reason is truth; the highest and noblest truths are those which religion supplies, and the reception of these by reason constitutes faith. Religion is indeed that first philosophy, else vainly sought, in which alone the eternal form of truth subsists. The triumph of reason is to give to the objects of intellect the victory over those of sense; and to make the distant and the future gain ascendancy over the present: but this triumph, in its most exalted degree, is that of faith, —it is by faith, the evidence of things not seen, that objects spiritually discerned overbalance the objects of sight. It is by faith, the substance of things hoped for, that eternity triumphs over time;—this is the victory that overcometh the world, even our faith; it is faith that giveth to reason the wing and the eye of the eagle, enabling her to soar towards the heavens, and to look upwards to the Sun of Righteousness.

APPENDIX.

No. I.—Page 50.

[*Extracted, by permission, from the Preliminary Treatise of the Library of Useful Knowledge; On the Objects, Advantages, and Pleasures of Science.*]

The illustrations of the argument which it is the object of this part of the author's Address to exhibit, which may be deduced from the consideration of the organic structures and habits of animals, &c. have been so concisely and excellently stated in the very useful treatise above cited, that I am truly gratified in having obtained permission to enrich my Address with the following extract; being fully persuaded that thereby I shall greatly increase its utility to the collegiate class to which it is essentially and principally dedicated*.

"For the purpose of further illustrating the advantages of Philosophy, its tendency to enlarge the mind, as well as to interest it agreeably, and afford pure and solid gratification, a few instances may be given of the singular truths brought to

* On the same subject I would particularly recommend to the attention of the class the very interesting Treatise on Animal Mechanics by Dr. Olinthus Gregory, which forms a part of the series of publications by the same Society.

light by the application of mathematical, mechanical, and chemical knowledge to the habits of animals and plants; and some examples may be added of the more ordinary and easy, but scarcely less interesting observations, made upon those habits, without the aid of the profounder sciences.

"We may remember the curve line which mathematicians call a cycloid. It is the path which any point of a circle, moving along a plane, and round its centre, traces in the air; so that the nail on the felly of a cart-wheel moves in a cycloid, as the cart goes along, and as the wheel itself both turns round its axle, and is carried along the ground. Now this curve has certain properties of a peculiar and very singular kind with respect to motion. One is, that if any body whatever moves in a cycloid by its own weight or swing, together with some other force acting upon it, it will go through all distances of the same curve in exactly the same time; and, accordingly, pendulums are contrived to swing in such a manner, that they shall describe cycloids, or curves very near cycloids, and thus move in equal times, whether they go through a long or a short part of the same curve. Again, if a body is to descend from any one point to another, not in the perpendicular, by means of some force acting on it together with its weight, the line in which it will go the quickest of all will be the cycloid, not the straight line, though that is the shortest of all lines which can be drawn between the two points; nor any other curve whatever, though many are much flatter, and therefore shorter than the cycloid,—but the cycloid, which is longer than they,

is yet of all curves or straight lines which can be drawn, the one the body will move through in the shortest time. Suppose the body is to move from one point to another, by its weight and some other force acting together, but to go through a certain space, as a hundred yards, the way it must take to do this in the shortest time possible is by moving in a cycloid; or the length of a hundred yards must be drawn into a cycloid, and then the body will descend through the hundred yards in a shorter time than it could go the same distance in any other path whatever. Now, it is believed that birds which build in the rocks, drop or fly down from height to height in this course. It is impossible to make very accurate observations on their flight and path; but there is a general resemblance certainly between the course they take and the cycloid, which has led ingenious men to adopt this opinion.

"If we have a certain quantity of any substance, a pound of wood, for example, and would fashion it in the shape to take the least room, we must make a globe of it; it will in this figure have the smallest surface. But suppose we want to form the pound of wood, so that in moving through the air or water it shall meet with the least possible resistance, then we must lengthen it out for ever, till it becomes not only like a long-pointed pin, but thinner and thinner, longer and longer, till it is quite a straight line, and has no perceptible breadth or thickness at all. If we would dispose of the given quantity of matter so that it shall have a certain length only, say a foot, and a certain breadth at the thickest part, say three inches,

and move through the air or water with the smallest possible resistance which a body of those dimensions can meet, then we must form it into a figure of a peculiar kind, called the *Solid of least resistance*, because of all the shapes that can be given to the body, its length and breadth remaining the same, this is the one which will make it move with the least resistance through the air, or water, or other fluid. A very difficult chain of mathematical reasoning, by means of the highest branches of algebra, leads to a knowledge of the curve, which by revolving on its axis makes a solid of this shape, in the same way that a circle by so revolving makes a sphere or globe; and the curve certainly resembles closely the face or head part of a fish. Nature, therefore (by which we always mean the Divine Author of nature), has fashioned these fishes so, that, according to mathematical principles, they swim the most easily through the element they live and move in.

"Suppose upon the face part of one of these fishes a small insect were bred, endowed with faculties sufficient to reason upon its condition, and upon the motion of the fish it belonged to, but never to have discovered the whole size and shape of the face part, it would certainly complain of the form as clumsy, and fancy that it could have made the fish so as to move with less resistance. Yet if the whole shape were disclosed to it, and it could discover the principle on which that shape was preferred, it would at once perceive, not only that what had seemed clumsy was skilfully contrived, but that if any other shape whatever had been taken, there would have been

an error committed; nay, *that there must of necessity* have been an error; and that the very best possible arrangement had been adopted. So it may be with man in the Universe, where, seeing only a part of the great system, he fancies there is evil; and yet, if he were permitted to survey the whole, what had seemed imperfect might appear to be necessary for the general perfection, insomuch that any other arrangement, even of that seemingly imperfect part, must needs have rendered the whole less perfect. The common objection is, that what seems evil might have been avoided; but in the case of the fish's shape it *could not* have been avoided.

"It is found by optical inquiries, that the rays or particles of light, in passing through transparent substances of a certain form, are bent to a point where they make an image or picture of the shining bodies they come from, or of the dark bodies they are reflected from. Thus, if a pair of spectacles be held between a candle and the wall, they make two images of the candle upon it; and if they be held between the window and a sheet of paper when the sun is shining, they will make a picture on the paper of the houses, trees, fields, sky, and clouds. The eye is found to be composed of several natural magnifiers which make a picture on a membrane at the back of it, and from this membrane there goes a nerve to the brain, conveying the impression of the picture, by means of which we see it. Now, white light was discovered by Newton to consist of different-coloured parts, which are differently bent in passing through transparent substances, so that the lights of dif-

ferent colours come to a point at different distances, and thus create an indistinct image. This was long found to make our telescopes imperfect, insomuch that it became necessary to make them of reflectors or mirrors, and not of magnifying glasses—the same difference not being observed to affect their reflection. But another discovery was about fifty years afterwards made by Mr. Dollond, that by combining different kinds of glass in a compound magnifier, the difference may be greatly corrected; and on this principle he constructed his telescopes. It is found, too, that the different natural magnifiers of the eye are combined upon a principle of the same kind. Thirty years later, a third discovery was made by Mr. Blair, of the greatly superior effect which combinations of different liquids have in correcting the imperfection; and, most wonderful to think, when the eye is examined, we find it consists of different liquids, acting naturally upon the same principle which was thus recently found out in Optics by many ingenious mechanical and chemical experiments.

"Again, the point to which any magnifier collects the light is more or less distant as the magnifier is smaller or rounder, so that a small globe of glass or any transparent substances makes a microscope. And this property of light depends upon the nature of lines, and is purely of a mathematical nature, after we have once ascertained by experiment, that light is bent in a certain way when it passes through transparent bodies. Now birds flying in the air, and meeting with many obstacles, as branches and leaves of trees, require

to have their eyes sometimes as flat as possible for protection; but sometimes as round as possible, that they may see the small objects, flies and other insects, which they are chasing through the air, and which they pursue with the most unerring certainty. This could only be accomplished by giving them a power of suddenly changing the form of their eyes. Accordingly, there is a set of hard scales placed on the outer coat of their eye, round the place where the light enters; and over these scales are drawn the muscles or fibres by which motion is communicated; so that, by acting with these muscles, the bird can press the scales, and squeeze the natural magnifier of the eye into a round shape when it wishes to follow an insect through the air, and can relax the scales, in order to flatten the eye again, when it would see a distant object, or move safely through leaves and twigs. This power of altering the shape of the eye is possessed by birds of prey in a very remarkable degree. They can see the smallest objects close to them, and can yet discern larger bodies at vast distances, as a carcass stretched upon the plain, or a dying fish afloat on the water.

"A singular provision is made for keeping the surface of the bird's eye clean, for wiping the glass of the instrument, as it were, and also for protecting it, while rapidly flying through the air and through thickets, without hindering the sight. Birds are, for these purposes, furnished with a third eyelid, a fine membrane or skin, which is constantly moved very rapidly over the eyeball by two muscles placed in the back of the eye.

One of the muscles ends in a loop, the other in a string which goes through the loop, and is fixed in the corner of the membrane, to pull it backward and forward. If you wish to draw a thing towards any place with the least force, you must pull directly in the line between the thing and the place; but if you wish to draw it as quickly as possible, and do not regard the loss of force, you must pull it obliquely, by drawing it in two directions at once. Tie a string to a stone, and draw it straight towards you with one hand; then, make a loop on another string, and running the first through it, draw one string in each hand, not towards you, but side-ways, till both strings are stretched in a straight line: you will see how much swifter the stone moves than it did before when pulled straight forward. Now this is proved, by mathematical reasoning, to be the necessary consequence of forces applied obliquely; there is a loss of power, but a great increase of velocity. The velocity is the thing required to be gained in the third eyelid, and the contrivance is exactly that of a string and and a loop, moved each by a muscle, as the two strings are by the hands in the case we have been supposing.

"A third eyelid of the same kind is found in the horse, and called the *haw;* it is moistened with a pulpy substance (or mucilage) to take hold of the dust on the eyeball, and wipe it clean off, so that the eye is hardly ever seen with anything upon it, though greatly exposed from its size and posture. The swift motion of the haw is given to it by a gristly elastic substance, placed between the eyeball and the socket, and striking obliquely,

so as to drive out the haw with great velocity over the eye, and then let it come back as quickly. Ignorant persons, when this haw is inflamed from cold, and swells so as to appear, which it never does in a healthy state, often mistake it for an imperfection, and cut it off. So nearly does ignorance produce the same mischief as cruelty! They might as well cut off the pupil of the eye, taking it for a black spot.

"If any quantity of matter, as a pound of wood or iron, is fashioned into a rod of a certain length, say one foot, the rod will be strong in proportion to its thickness; and, if the figure is the same, that thickness can only be increased by making it hollow. Therefore, hollow rods or tubes, of the same length and quantity of matter, have more strength than solid ones. This is a principle so well understood now, that engineers make their axles and other parts of machinery hollow, and therefore stronger with the same weight, than they would be if thinner and solid. Now the bones of animals are all more or less hollow; and are therefore stronger with the same weight and quantity of matter than they otherwise would be. But birds have the largest bones in proportion to their weight; their bones are more hollow than those of animals which do not fly; and therefore they have strength without having to carry more weight than is absolutely necessary. Their quills derive strength from the same construction. They have another peculiarity to help their flight. No other animals have any communication between the air-vessels of their lungs and the hollow parts of their bodies; but birds have; and by this means they

can blow out their bodies as we do a bladder, and thus make themselves lighter when they would either make their flight towards the ground slower, or rise more swiftly, or float more easily in the air. Fishes possess a power of the same kind, though not by the same means. They have air-bladders in their bodies, and can puff them out, or press them closer, at pleasure: when they want to rise in the water, they fill out the bladder, and this lightens them. If the bladder breaks, the fish remains at the bottom, and can only be held up by the most laborious exertions of the fins and tail. Accordingly, flat fish, as skaits and flounders, which have no air-bladders, seldom rise from the bottom, but are found lying on banks in the sea, or at the bottom of sea rivers.

"If you have a certain space, as a room, to build up with closets or little cells, all of the same size and shape, there are only three figures which will answer, and enable you to fill the room without losing any space between the cells; they must either be squares, or figures of three equal sides, or figures of six equal sides. With any other figures whatever, space would be lost between the cells. This is evidently true upon considering the matter; and it is proved by mathematical reasoning. The six-sided figure is by far the most convenient of these three shapes, because its corners are flatter, and any round body placed in it has therefore more space, there being less room lost in the corners. Likewise, this figure is the strongest of the three; any pressure either from without or from within will hurt it less, as it has something of the strength of an arch. A round figure would

be still stronger, but then room would be lost between the circles, whereas none at all is lost with the six-sided figure. Now, it is a most remarkable fact, that *Bees* build their cells exactly in this shape, and thereby save both room and materials beyond what they could save if they built in any other shape whatever. They build in the very best possible shape for their purpose, which is to save all the room and all the wax they can. So far as to the shape of the walls of each cell; but the roof and floor, or top and bottom, are built on equally true principles. It is proved by mathematicians, that to give the greatest strength and save the most room, the roof and floor must be made of three square planes meeting in a point; and they have further proved by a demonstration belonging to the higher parts of Algebra, that there is one particular angle or inclination of those planes to each other where they meet, which makes a greater saving of materials and of work than any other inclination whatever could possibly do. Now, the bees actually make the tops and bottoms of their cells of three planes meeting in a point, and the inclination or angle at which they meet is precisely the one found out by the mathematicians to be the best possible for saving wax and work. Who would dream for an instant of the bee knowing the highest branches of Mathematics—the fruits of Newton's most wonderful discovery—a result, too, of which he was himself ignorant, one of his most celebrated followers having found it out? This little insect works with a truth and correctness which are quite perfect, and according to the principles at which man

has only arrived after ages of slow improvement in the most difficult branch of the most difficult science. But the mighty and all-wise Creator, who made the insect and the philosopher, bestowing reason on the latter, and giving the former to work without it,—to Him all truths are known from all eternity, with an intuition that mocks even the conceptions of the sagest of human kind.

"It may be recollected, that when the air is exhausted or sucked out of any vessel, there is no longer the force necessary to resist the pressure of the air on the outside; and the sides of the vessel are therefore pressed inwards with violence: a flat glass would thus be broken, unless it were very thick; a round one, having the strength of an arch, would resist better; but any soft substance, as leather or skin, would be crushed or squeezed together at once. If the air was only sucked out slowly, the squeezing would be gradual, or, if it were only half sucked out, the skin would only be partly squeezed together. This is the very process by which *Bees* reach the fine dust and juices of hollow flowers, like the honeysuckle, and some kinds of long fox-glove, which are too narrow for them to enter. They fill up the mouth of the flower with their bodies, and suck out the air, or at least a large part of it; this makes the soft sides of the flower close, and squeezes the dust and juice towards the insect as well as a hand could do, if applied to the outside.

"We may remember this pressure or weight of the atmosphere as shown by the barometer, the sucking-pump, and the air-pump. Its weight is near fifteen pounds on every square inch, so that

if we could entirely squeeze out the air between our two hands, they would cling together with a force equal to the pressure of double this weight, because the air would press upon both hands; and if we could contrive to suck or squeeze out the air between one hand and the wall, the hand would stick fast to the wall, being pressed on it with the weight of above two hundred weight, that is, near fifteen pounds on every square inch of the hand. Now, by a late most curious discovery of Sir Everard Home, the distinguished anatomist, it is found that this is the very process by which *Flies* and other insects of a similar description are enabled to walk up perpendicular surfaces, however smooth, as the sides of walls and panes of glass in windows, and to walk as easily along the ceiling of a room with their bodies downwards and their feet over head. Their feet, when examined by a microscope, are found to have flat skins or flaps, like the feet of web-footed animals, as ducks and geese; and they have towards the back part or heel, but inside the skin or flap, two very small toes so connected with the flap as to draw it close down upon the glass or wall the fly walks on, and to squeeze out the air completely, so that there is vacuum made between the foot and the glass or wall. The consequence of this is, that the air presses the foot on the wall with a very considerable force compared to the weight of the fly; for if its feet are to its body in the same proportion as ours are to our bodies, since we could support by a single hand on the ceiling of the room (provided it made a vacuum) more than our whole weight, namely, a weight of fifteen

stone, the fly can easily move on four feet in the same manner by help of the vacuum made under its feet. It has likewise been found that some of the larger sea animals are by the same construction, only upon a greater scale, enabled to climb the perpendicular and smooth surfaces of the ice-hills among which they live. Some kinds of lizard have the same power of climbing, and of creeping with their bodies downwards along the ceiling of a room; and the means by which they are enabled to do so are the same. In the large feet of these animals, the contrivance is easily observed, of the two toes or tightners, by which the skin of the foot is pinned down, and the air excluded in the act of walking or climbing; but it is the very same, only on a larger scale, with the mechanism of a fly's or a butterfly's foot; and both operations, the climbing of the sea-horse on the ice, and the creeping of the fly on the window or the ceiling, are performed exactly by the same power, the weight of the atmosphere, which causes the quicksilver to stand in the weather-glass, the wind to whistle through a key-hole, and the piston to descend in a steam-engine.

"Although philosophers are not agreed as to the peculiar action which light exerts upon vegetation, and there is even some doubt respecting the decomposition of air and water during that process, one thing is undeniable, the necessity of light to the growth and health of plants; and accordingly they are for the most part so formed as to receive it at all times when it shines on them. Their cups, and the little assemblages of their leaves before they sprout, are found to be more

or less affected by the light, so as to open and receive it. In several kinds of plants this is more evident than in others; their flowers close entirely at night, and open in the day. Some, as the Sunflower, and a tribe of the like description, constantly turn round towards the light, following the sun, as it were, while he makes or seems to make his revolution, so that they receive the greatest quantity possible of his rays. Plants of this kind require more light than others for their growth, and this is the provision made for supplying them.

"The lightness of inflammable gas is well known. When bladders, of any size, are filled with it, they rise upwards, and float in the air. Now, it is a most curious fact, that the fine dust, by means of which plants are impregnated one by the other, is composed of very small globules, filled with this gas,—in a word, of small air balloons. These globules thus float from the male plant through the air, and striking against the females, are detained by a glue prepared on purpose to stop them, which no sooner moistens the globules than they explode, and their substance remains, the gas flying off which enabled them to float. A provision of a very simple kind is also made to prevent the male and female blossoms of the same plant from breeding together, this being found to hurt the breed of vegetables, just as breeding in and in does the breed of animals. It is contrived that the dust shall be shed by the male blossom before the female is ready to be affected by it, so that the impregnation must be performed by the dust of some other plant, and in this way the breed be crossed. The light gas with which the globules are filled is

most essential to this operation, as it conveys them to great distances. A plantation of yew trees has been known, in this way, to impregnate another several hundred yards off.

"The contrivance by which some creeper plants are enabled to climb walls, and fix themselves, deserves attention. The *Virginia Creeper* has a small tendril, ending in a claw, each toe of which has a knob, thickly set with extremely small bristles; they grow into the invisible pores of the wall, and swelling stick there as long as the plant grows, and prevent the branch from falling; but when the plant dies, they become thin again, and drop out, so that the branch falls down. The *Vanilla* plant of the West Indies climbs round trees likewise by means of tendrils; but when it has fixed itself, the tendrils drop off, and their place is supplied by leaves.

"It is found by chemical experiments, that the juice which is in the stomachs of animals (called the *gastric* juice, from a Greek word signifying *the belly*), has very peculiar properties. Though it is for the most part a tasteless, clear, and seemingly a very simple liquor, it nevertheless possesses extraordinary powers of dissolving substances which it touches or mixes with; and it varies in different classes of animals. In one particular it is the same in all animals: it will not attack living matter, but only dead; the consequence of which is, that its powers of eating away and dissolving are perfectly safe to the animals themselves, in whose stomachs it remains without ever hurting them. This juice differs in different animals according to the food on which they subsist: thus, in birds of prey, as kites, hawks, owls, it

only acts upon animal matter, and does not dissolve vegetables. In other birds, and in all animals feeding on grass, as oxen, sheep, hares, it dissolves vegetable matter, as grass, but will not touch flesh of any kind. This has been ascertained by making them swallow balls with meat in them, and several holes drilled through, to let the gastric juice reach the meat: no effect was produced upon it. We may further observe, that there is a most curious and beautiful correspondence between this juice in the stomach of different animals and the other parts of their bodies, connected with the important operations of eating and digesting their food. The use of the juice is plainly to convert what they eat into a fluid, from which, by various other processes, all their parts, blood, bones, muscles, &c. are afterwards formed. But the food is first of all to be obtained, and then prepared by bruising, for the action of the juice. Now birds of prey have instruments, their claws and beak, for tearing and devouring their food (that is animals of different kinds), but those instruments are useless for picking up and crushing seeds: accordingly, they have a gastric juice which dissolves the animals they eat; while birds which have only a beak fit for pecking, drinking, and eating seeds, have a juice that dissolves seeds, and not flesh. Nay more, it is found that the seeds must be bruised before the juice will dissolve them: this you find by trying the experiment in a vessel with the juice; and accordingly the birds have a gizzard, and animals which graze have flat teeth, which grind and bruise their food before the gastric juice is to act upon it.

"We have seen how wonderfully the *Bee* works, according to rules discovered by man thousands of years after the insect had followed them with perfect accuracy. The same little animal seems to be acquainted with principles of which we are still ignorant. We can, by crossing, vary the forms of cattle with astonishing nicety; but we have no means of altering the nature of an animal once born, by means of treatment and feeding. This power, however, is undeniably possessed by the bees. When the queen bee is lost, by death or otherwise, they choose a grub from among those which are born for workers; they make three cells into one, and placing the grub there, they build a tube round it; they afterwards build another cell of a pyramidal form, into which the grub grows: they feed it with peculiar food, and tend it with extreme care. It becomes, when transformed from the worm to the fly, not a worker, but a queen bee.

"These singular insects resemble our own species in one of our worst propensities, the disposition to war; but their attention to their sovereign is equally extraordinary, though of a somewhat capricious kind. In a few hours after their queen is lost, the whole hive is in a state of confusion. A singular humming is heard, and the bees are seen moving all over the surface of the combs with great rapidity. The news spreads quickly, and when the queen is restored, quiet immediately succeeds. But if another queen is put upon them, they instantly discover the trick, and surrounding her, they either suffocate or starve her to death. This happens if the false queen is introduced

within a few hours after the first is lost or removed; but if twenty-four hours have elapsed, they will receive any queen, and obey her.

"The labours and the policy of the *Ants* are, when closely examined, still more wonderful, perhaps, than those of the *Bee*. Their nest is a city, consisting of dwelling-places, halls, streets, and squares, into which the streets open. The food they principally like is the honey which comes from another insect found in their neighbourhood, and which they, generally speaking, bring home from day to day as they want it. Later discoveries have shown that they do not eat grain, but live almost entirely on animal food and this honey. Some kinds of ant have the foresight to bring home the insects on whose honey they feed, and keep them in particular cells, where they guard them to prevent their escaping, and feed them with proper vegetable matter which they do not eat themselves. Nay, they obtain the eggs of those insects, and superintend their hatching, and then rear the young insect until he becomes capable of supplying the desired honey. They sometimes remove them to the strongest parts of their nest, where there are cells apparently fortified for protecting them from invasion. In those cells the insects are kept to supply the wants of the whole ants which compose the population of the city. It is a most singular circumstance in the economy of nature, that the degree of cold at which the ant becomes torpid is also that at which this insect falls into the same state. It is considerably below the freezing point; so that they require food the greater part of the winter, and if the insects on which they de-

pend for food were not kept alive during the cold in which the ants can move about, the latter would be without the means of subsistence.

"How trifling soever this little animal may appear in our climate, there are few more formidable creatures than the ant of some tropical countries. A traveller who lately filled a high station in the French Government, Mr. Malouet, has described one of their cities, and, were not the account confirmed by various testimonies, it might seem exaggerated. He observed at a great distance what seemed a lofty structure, and was informed by his guide that it consisted of an ant hill, which could not be approached without danger of being devoured. Its height was from fifteen to twenty feet, and its base thirty or forty feet square. Its sides inclined like the lower part of a pyramid, the point being cut off. He was informed that it became necessary to destroy these nests, by raising a sufficient force to dig a trench all round, and fill it with fagots, which were afterwards set on fire; and then battering with cannon from a distance, to drive the insects out and make them run into the flames. This was in South America; and African travellers have met with them in the same formidable numbers and strength.

"The older writers of books upon the habits of some animals abound with stories which may be of doubtful credit. But the facts now stated respecting the Ant and Bee may be relied on as authentic. They are the result of very late observations, and experiments made with great accuracy by several most worthy and intelligent men, and the greater part of them have the confirma-

tion arising from more than one observer having assisted in the inquiries. The habits of *Beavers* are equally well authenticated, and, being more easily observed, are vouched by a greater number of witnesses. These animals, as if to enable them to live and move either on land or water, have two web feet like those of ducks or water dogs, and two like those of land animals. When they wish to construct a dwelling-place, or rather city, for it serves the whole body, they choose a level place with a stream running through it; they dam up the stream so as to make a pond, and perform the operation as skilfully as we could ourselves. They drive into the ground stakes of five or six feet long in rows, wattling each row with twigs, and puddling or filling the interstices with clay which they ram close in, so as to make the whole solid and water-tight. This dam is likewise shaped on the truest principles*; for the upper side next the

* If the base is twelve, and the top three feet thick, and the height six feet, the face must be the side of a right-angled triangle, whose height is eight feet. This would be the exact proportion which there ought to be, upon mathematical principles, to give the greatest resistance possible to the water in its tendency to turn the dam round, provided the materials of which it is made were lighter than water in the proportion of forty-four to a hundred. But the materials are probably more than twice as heavy as water, and the form of so flat a dike is taken, in all likelihood, in order to guard against a more imminent danger,—that of the dam being carried away by being shoved forwards. We cannot calculate what the proportions are which give the greatest possible resistance to this tendency, without knowing the tenacity of the materials, as well as their specific gravity. It may very probably be found that the construction is such as to secure the most completely against the two pressures at the same time.

water slopes, and the side below is perpendicular; the base of the dam is ten or twelve feet thick: the top or narrow part two or three, and it is sometimes as long as a hundred feet. The pond being thus formed and secured, they make their houses round the edge of it; they are cells, with vaulted roofs, and upon piles; they are made of stones, earth, and sticks; the walls are two feet thick, and plastered as neatly as if the trowel had been used. Sometimes they have two or three stories for retreating to in case of floods, and they always have two doors, one towards the water, and one towards the land. They keep their winter provisions in stores, and bring them out to use; they make their beds of moss; they live on the bark of trees, gums, and crawfish. Each house holds from twenty to thirty, and there may be from ten to twenty-five houses in all. Some of their communities are therefore larger than others, but there are seldom fewer than two or three hundred inhabitants. In working they all bear their shares: some gnaw the trees and branches with their teeth to form stakes and beams; others roll the pieces to the water; others diving make holes with their teeth to place the piles in; others collect and carry stones and clay; others beat and mix the mortar; and others carry it on their broad tails, and with these beat it and plaster it. Some superintend the rest, and make signals by sharp strokes with the tail, which are carefully attended to; the beavers hastening to the place where they are wanted to work, or to repair any hole made by the water, or to defend themselves or make their escape, when attacked by an enemy.

"The fitness of different animals, by their bodily structure, to the circumstances in which they are found, presents an endless subject of curious inquiry and pleasing contemplation. Thus, the *Camel* which lives in sandy deserts has broad spreading hoofs to support him on the loose soil; and an apparatus in his body by which water is kept for many days, to be used when no moisture can be had. As this would be useless in the neighbourhood of streams or wells, and as it would be equally so in the desert, where no water is to be found, there can be no doubt that it is intended to assist in journeying across the sands from one watered spot to another. There is a singular and beautiful provision made in this animal's foot, for enabling it to sustain the fatigues of journeys under the pressure of its great weight. Beside the yielding of the bones and ligaments, or bindings, which gives elasticity to the foot of the deer and other animals, there is in the camel's foot, between the horny sole and the bones, a cushion, like a ball, of soft matter, almost fluid, but in which there is a mass of threads extremely elastic, interwoven with the pulpy substance. The cushion thus easily changes its shape when pressed, yet it has such an elastic spring, that the bones of the foot press on it uninjured by the heavy body which they support, and this huge animal steps as softly as a cat.

"Nor need we flee to the desert in order to witness an example of skilful structure in the foot: the *Horse's* limbs display it strikingly. The bones of the foot are not placed directly under the weight; if they were in an upright position, they would

make a firm pillar, and every motion would cause a shock. They are placed slanting or oblique, and tied together by an elastic binding on their lower surfaces, so as to form springs as exact as those which we make of leather or steel for carriages. Then the flatness of the hoof which stretches out on each side, and the frog coming down in the middle between the quarters, adds greatly to the elasticity of the machine. Ignorant of this, ill-informed farriers nail the shoe too far back, fixing the quarters, and causing permanent contraction, —so that the contracted hoof loses its elasticity; every step is a shock; inflammation and lameness ensue.

"The *Rein-deer* inhabits a country covered with snow the greater part of the year. Observe how admirably its hoof is formed for going over that cold and light substance, without sinking in it, or being frozen. The under side is covered entirely with hair, of a warm and close texture; and the hoof, altogether, is very broad, acting exactly like the snow-shoes which men have constructed for giving them a larger space to stand on than their feet, and thus to avoid sinking. Moreover, the deer spreads the hoof as wide as possible when it touches the ground; but, as this breadth would be inconvenient in the air, by occasioning a greater resistance while he is moving along, no sooner does he lift the hoof than the two parts into which it is cloven fall together, and so lessen the surface exposed to the air, just as we may recollect the birds doing with their bodies and wings. The shape and structure of the hoof is also well adapted to scrape away the snow, and enable the

animal to get at the particular kind of moss (or *lichen*) on which he feeds. This plant, unlike others, is in its full growth during the winter season: and the rein-deer, accordingly, thrives from its abundance, notwithstanding the unfavourable effects of extreme cold upon the animal system.

"There are some insects, of which the males have wings, and the females are grubs or worms. Of these, the *Glow-worm* is the most remarkable: it is the female, and the male is a fly, which would be unable to find her out, creeping as she does in the dark lanes, but for the shining light which she gives, to attract him.

"There is a singular fish found in the Mediterranean, called the *Nautilus*, from its skill in navigation. The back of its shell resembles the hulk of a ship; on this it throws itself, with two of its feet raised in the air, and over these two spreads a thin membrane to serve for a sail, paddling itself on with the other two feet as oars.

"The *Ostrich* lays and hatches her eggs in the sands; her form being ill adapted to that process, she has a natural oven furnished by the sand, and the strong heat of the sun. The *Cuckoo* is known to build no nest for herself, but to lay in the nests of other birds; but late observations show that she does not lay indiscriminately in the nests of all birds; she only chooses the nests of those which have bills of the same kind with herself, and therefore feed on the same kind of food. The *Duck*, and other birds breeding in muddy places, have a peculiar formation of the bill: it is both made so as to act like a strainer, separating the finer from the grosser parts of the liquid, and

it is more furnished with nerves near the point than the bills of birds which feed on substances exposed to the light; so that it serves better to grope in the dark stream for food, being more sensitive. The bill of the *Snipe* is covered with a curious net-work of nerves for the same purpose; but a bird (the *Toucan* or *Egg-sucker*), which chiefly feeds on the eggs found in birds' nests, and in countries where these are very deep and dark, has the most singular provision of this kind. Its bill is very broad and long; when examined, it is completely covered with branches of nerves in all directions; so that, by groping in a deep and dark nest, it can feel its way as accurately as the finest and most delicate finger could. Almost all kinds of birds build their nests of materials found where they inhabit, or use the nests of other birds; but the *Swallow of Java* lives in rocky caverns on the sea, where there are no materials at all for the purpose of building. It is therefore so formed as to secrete in its body a kind of slime with which it makes a nest, much prized as a delicate food in eastern countries.

" Plants, in many remarkable instances, are provided for by equally wonderful and skilful contrivances. There is one, the *Muscipula*, *Fly-trap*, or *Fly-catcher*, which has small prickles in the inside of two leaves, or half leaves, joined by a hinge; a juice or syrup is provided on their inner surface, and acts as a bait to allure flies. There are three small spines or prickles standing upright in this syrup, and upon the only part of this leaf which is sensitive to the touch. When the fly therefore settles upon this part, its touching as it

were the spring of the trap occasions the leaves to shut and kill and squeeze the insect; so that its juices and the air arising from their rotting serve as food to the plant.

"In the West Indies, and other hot countries, where rain sometimes does not fall for a great length of time, a kind of plant called the *Wild-pine* grows upon the branches of the trees, and also on the bark of the trunk. It has hollow or bag-like leaves, so formed as to make little reservoirs of water, the rain falling into them through channels which close at the top when full, to prevent it from evaporating. The seed of this useful plant has long threads, by which, when carried through the air, it catches any tree in the way, and falls on it and grows. Wherever it takes root, though on the under side of a bough, it grows straight upwards, otherwise the leaves would not hold water. It holds in one leaf from a pint to a quart; and although it must be of great use to the trees it grows on, to birds and other animals its use is even greater. Another tree, called the *Water-with*, in Jamaica, has similar uses; it is like a vine in size and shape, but growing in very parched districts, is yet so full of clear sap or water, that on cutting a piece two or three yards long, and merely holding it to the mouth, a plentiful draught is obtained. In the East there is a plant somewhat of the same kind, called the *Bejuco*, which grows near other trees and twines round them, with its end hanging downwards, but so full of juice, that on cutting it, a plentiful stream of water spouts from it; and this, not only by its touching the tree so closely must refresh it, but is

a supply to animals, and to the weary herdsman on the mountains."

No. II.—Page 74.

[*Extracted, by permission, from the Article on Dr. Townson's Practical Discourses, Quarterly Review*, No. lxxxviii.]

The author's wish to incorporate with this Address such materials as being scattered in different publications might have been otherwise overlooked by the Class, although they appeared to him very important in the prosecution of the Theological course thus opened, has further been materially assisted by the permission which he has obtained, to extract from one of our leading literary journals the following very satisfactory remarks on the probable history of the successive production of the several Evangelical narratives, on the origin and explanation of the phænomena of their *resemblances* and variations, and on the undesigned coincidences which they exhibit.

"'The Discourses on the Gospels,' by Dr. Townson, may be regarded as at once offering a body of internal evidence for the truth of the Gospels, and a probable explanation of the agreements and differences which they severally present. Now, a principle which at one and the same time yields testimony to the authenticity of Scripture, and a solution of the difficulties which encumber it, has a double claim upon our confidence: just as we

may be supposed to have a right key when it both fastens and opens the lock. Dr. Townson's theory is this—that

" 'The progress in planting the Christian faith was from a Church purely of the circumcision, Samaritans included, to a mixed community, and from thence to distinct churches of the Gentiles. And there is a strong presumption (he thinks) that the Gospels were published successively, as they were wanted by the churches to whose use they were immediately adapted: that St. Matthew wrote for the first; St. Mark for the second; and St. Luke for the third settlement of the faith; and that this view of things presents us with the order in which the Gospels have all along been disposed.'

" Here, then, Dr. Townson takes up his position; the four Evangelists have been almost invariably placed, from the earliest times, in the order in which they now stand; the presumption therefore is, that such was the order in which they were originally published. Again, the progress of Christianity was this: (the history of it, as given in the Acts of the Apostles, were there no other, testifies as much:) it began with the *Jews*, who were the first Christian congregation; it proceeded to a mixed society, consisting both of *Jews* and *Gentiles*, who were the next; and it ended with a body composed of *Gentiles* chiefly or altogether. Let us, then, observe whether the historical order of the Gospels does not tally with the historical progress of the cause which the Gospels advocate, deducing our argument from internal evidence only. Now, St. Matthew, as compared with St. Mark, writes as though he was living in Judea—

amongst people who knew all the Jewish customs as well as himself; who had the Temple before their eyes, and the offerings made in it; to whom the phraseology, the geography, the local peculiarities of the Holy Land were perfectly familiar: above all, who partook of the Jewish expectations of a Messiah, and understood the numerous prophecies which were thought to relate to him; for to these St. Matthew points far more frequently than the other Evangelists, and indeed makes it a very primary object to develop the prophetical Christ in Jesus of Nazareth. St. Mark makes much more limited demands upon his readers for knowledge of this kind; he explains where St. Matthew is silent; and accommodates (as it would seem) the narrative of the latter, in very many instances, to a different audience.

"Examples are everything: thus, in Matth. iii. 6, we read, 'And were baptised of him in Jordan;' whereas, St. Mark, i. 5, has it, 'And were baptised of him in *the river* of Jordan.' The general identity of phrase here, and in the context of the two passages, argues the one Evangelist to have consulted the other, whilst the insertion of the word *river* by the one, argues that his congregation had members in it to whom the geography of Judea was less perfectly known than to those of his colleague. In Matthew, ix. 14, we find, 'Then came the disciples of John, saying, Why do we and the pharisees fast oft, but thy disciples fast not?' The thing was notorious: but St. Mark, ii. 18, speaks to the uninitiated; he therefore supplies a preface, '*And the disciples of John and of the pharisees used to fast*,—And they came and say unto him,

Why do the disciples of John, and of the pharisees, fast, but thy disciples fast not?' The introduction added, the rest is the same. In the fifteenth chapter of Matthew, as compared with the seventh of Mark, there is a very remarkable instance to the same effect,—' Then came to Jesus scribes and pharisees which were of Jerusalem, saying, Why do thy disciples transgress the tradition of the elders, for they wash not their hands when they eat bread?' Now, look at the commentary with which St. Mark, who adopts the narrative in the main, interpolates it,—' Then came together unto him the pharisees and certain of the scribes which came from Jerusalem,—And when they saw some of his disciples eat bread with defiled (*that is to say, with unwashen*) hands, they found fault.—*For the pharisees, and all the Jews, except they wash their hands oft, eat not, holding the tradition of the elders.—And when they come from the market, except they wash, they eat not. And many other things there be, which they have received to hold, as the washing of cups, and pots, brazen vessels, and of tables.*—Then the pharisees and scribes asked him, Why walk not thy disciples according to the tradition of the elders?' Here we see St. Matthew's text transferred, with little alteration, into St. Mark's, and a note of explanation let into it. In St. Matthew, xxi. 19, we are told, 'Jesus saw a fig-tree in the way, and he came to it, and found nothing thereon but leaves only.' St. Mark, xi. 13, adds, for the purpose of completing an expression which he thought elliptical and obscure, more especially to persons who might not know that at the passover (which was the date of

this transaction) the figs in Judea were not ripe for gathering, '*for the time of figs was not yet.*' St. Matthew, viii. 8, 9, uses the word Gehenna, a word purely Jewish. St. Mark, ix. 43, 48, uses the same in the corresponding passage of his Gospel, but he annexes a paraphrastical explanation of it. St. Matthew, xv. 22, speaks of a '*Canaanitish* woman.' St. Mark, vii. 2, calls the same person a *Syro-phœnician*;—the former a term perfectly intelligible to the readers of the ancient Scriptures, though a term now nearly obsolete, for it occurs in only two other places in the New Testament (Acts vii. 11, and xiii. 19); and, accordingly, one who wrote at a distance from Canaan, and addressed himself to persons who might or might not be acquainted with the language of the Old Testament, substitutes for it the more popular word Syro-phœnician. Nay, sometimes even a slight grammatical emendation may be thought to betray the order in which the two Evangelists wrote, and the ηγερθη απο των νεκρων of St. Matthew, xiv. 2, is written by St. Mark εκ νεκρων ηγερθη, vi. 14; the preposition in the latter case being less ambiguous in its meaning. And again, St. Matthew's sentence 'but are as the Angels of God in heaven,' xxii. 30, is expressed with a similar regard to precision by St. Mark, xii. 25, 'but are as the Angels *who are* in heaven.'

"By these, and other instances of the same kind, we seem justified in the conclusion that St. Mark wrote after St. Matthew, seeing that he often completes, explains, and develops the narrative of St. Matthew; but if after him, then is it probable that the congregation which required this new

Gospel would not be made up of Jews only, for the Christian faith soon extended to Gentiles too; and accordingly, with the internal evidence of its being posterior in time to the Gospel of St. Matthew, comes also the internal evidence that it was addressed to Gentiles as well as Jews. The parallel which has been already run between certain passages in St. Matthew and St. Mark, whilst it establishes one of these points, establishes the other also; for the changes to which texts in St. Matthew are subjected, when they re-appear in St. Mark, are of a kind to show no less that he made them in accommodation to the Gentiles, than that he wrote after St. Matthew. But if more proof of the *mixed* character of the converts, for whom St. Mark wrote, were demanded, more might be supplied. For instance, that a portion of those whom he addressed were *Jews*, may be argued from his recording at so much length the reproofs which our Lord directed against the characteristic vices of the pharisees,—vii. 3—13; the nature of the marriage union, and the manner in which the Mosaical law of divorce had been abused,—x. 2, 12; the decision of the question touching the comparative importance of the commandments, which was the greatest, the doubt being altogether judaical—some Jews holding sacrifice, others circumcision, a third party the observance of the Sabbath, to be the greatest—xi. 12, 14; the caution against false Christs, a caution of which the Jews stood chiefly in need, they being in expectation of a temporal Messiah, and of which events proved that they stood in need,—xiii. 6, 21, 23;—not so, perhaps, the Gentiles.

"On the other hand, that amongst those for whom St. Mark wrote there were *heathens*, nay, more, heathens who did not live in Judea, and to whom the Jewish customs and language were imperfectly known, (heathens of *Rome*, as it should seem, and as ecclesiastical authority asserts,) is no less plain from other passages:—'*Go not into the way of the Gentiles*, and into any city of the Samaritans enter ye not; but go rather to the lost sheep of the house of Israel,' is a part of the charge which our Lord gives to his disciples, as reported by St. Matthew, x. 5, 6. St. Mark, vi. 7, 11, who relates many of the particulars of this address, omits this one; and so does St. Luke, ix. 3, 5; both probably for the same reason, a desire not to give needless offence to the Gentiles, by recording a clause in the instructions affecting them which had been since withdrawn. Interpretations annexed by St. Mark, to words of common occurrence amongst Jews, are evidently intended for strangers:—'Boanerges, *which is*, The sons of thunder,' iii. 17; 'Corban, *that is to say*, a gift,' vii. 11; 'Ephphatha, *that is*, Be opened,' vii. 34; 'two lepta (mites), *which make* a quadrans (farthing),' xii. 42: here it is further remarkable that a Greek coin is explained by a *Latin* equivalent: 'the soldiers led him away into the hall, *that is* (ὁ εστι), the prætorium,' xv. 16, where again the Greek word is turned by the Latin: 'The centurion' (ὁ κεντυριων), xv. 39,—again a Latin word; in the parallel passage of St. Matthew, xxvii. 54, and of St. Luke, xxiii. 47, the same officer is expressed by a Greek term (ἑκατονταρχος); 'The preparation, *that is*,

the day before the Sabbath,' xv. 42; though the preparation was a common name amongst the Jews for Friday. Moreover, St. Mark speaks of Simon as the father of Alexander and *Rufus*, xv. 21, as though this hint was sufficient to designate the individual to those for whom he wrote. Now, Rufus was a distinguished *Roman* convert, of whom St. Paul speaks (Rom. xvi. 13); and if this be the same Rufus, the circumstance still points to Romans as members of St. Mark's congregation.

"Thus there is reason to think from internal evidence that St. Mark wrote at a period *later* than St. Matthew, and from the same evidence there is again reason to think that he wrote for a *mixed* assembly, consisting both of Jews and Gentiles. Now, these two inductions are remarkably consistent, the later date of the Gospel agreeing with the greater diffusion of Christianity; either conclusion corroborates the other, and both minister to the credibility of the Scriptures.

"A similar comparison of St. Mark with St. Luke affords similar ground for arguing the priority in point of time of the former Evangelist. Thus, St. Mark tells us that, 'as Jesus sat at meat in *his* house, many publicans and sinners sat also together with Jesus, and his disciples,' ii. 15. As this occurs immediately after the call of Levi, it is reasonable to suppose that the house of Levi was here meant; the passage, however, is not so worded as to determine this with certainty; accordingly St. Luke comes after St. Mark, and puts the matter out of all doubt, 'and Levi made him a great feast in *his own* house,' v. 29. Some-

times, when the sentence is on the whole all but identical in these two writers, there is an improved collocation of some member in it, which indicates St. Luke's hand to have been the later of the two. Thus, St. Mark, ii. 25, 26, 'And he said unto them, Have ye never read what David did when he had need, and was an hungered, he and they that were with him? How he went into the house of God, in the days of Abiathar the high priest, and did eat the shew-bread (which is not lawful to eat but for the priest), and gave also to them that were with him.' St. Luke, vi. 3, 4, inverts the last two clauses, and avoids the parenthesis, reading, 'how he went into the house of God, and did take and eat, and gave also to them that were with him, the shew-bread, which is not lawful to eat but for the priests alone.' In the two accounts of the miracle performed on the daughter of Jairus, that of St. Luke, though agreeing in great part to the letter with that of St. Mark, is still the more complete: 'As soon as Jesus heard the word that was spoken, he saith unto the rulers of the synagogue, Fear not, only believe. *And he suffered no man to follow him save Peter, James, and John the brother of James.* And he cometh to the house of the ruler of the synagogue.' So speaks St. Mark, v. 36, 38. But the multitude had 'thronged' Jesus just before;—did he disengage himself from them in the high road, and gather to him his three attendants without an effort? 'But when Jesus heard it, he answered him, saying, Fear not, only believe, and she shall be made whole. *And when he came into the house he suffered no man to go in*, save Peter, and James,

and John, and the father and the mother of the maiden.' So speaks St. Luke, viii. 50, 51, who clears the case up by informing us that the throng was escaped at the house-door, which was closed against the ingress of all but those whom Jesus selected. In the scene of the widow at the treasury, St. Mark writes, 'for all they have cast in of their abundance, but she of her want hath cast in all that she had, her whole living,' xii. 44; St. Luke, nearly in the same words, but with one small supplement, 'for all these have cast in of their abundance unto the *offerings of God*, but she of her want hath cast in all the living that she had,' xxi. 4: the addition is not an idle one, especially when Gentiles were to be readers, and as St. Mark had such amongst those for whom he wrote, such an addition would not have been ill bestowed even by him. Whilst, therefore, the general similarity of the two passages indicates that the one Evangelist must have seen the other, the addition of a word of explanation by St. Luke, which would have been equally in its place in the text of either party, argues St. Luke to have been the later writer of the two. St. Luke might have added the clause, but St. Mark would scarcely have expunged it. The details of the mockery of our Lord, immediately before his crucifixion, present another argument for the priority of St. Mark's Gospel. St. Matthew had represented the scoffers as saying, 'Prophesy unto us, thou Christ, who is he that smote thee,' xxvi. 68; but he makes no mention of the blindfolding. St. Mark says, that 'they covered his face and bade him prophesy,' xiv. 65; but he fails to

tell what was to be the subject of his prophecy. Accordingly St. Luke profits by the examples of both, and with St. Mark tells of the blindfolding, and with St. Matthew, of the prophecy and its objects: 'And the men that held Jesus mocked him and smote him. And when they had *covered* him, they struck him on the face, and asked him, saying, *Prophesy* who is he that *smote* thee,'—xxii. 63, 64. The other arguments we shall mention for the priority of St. Mark's Gospel, are such as turn upon points of grammar and construction. The force of these (which is considerable) can only be perceived in the original, and we are sorry for it, it being our object to treat this question in a manner rather popular than scholastic.

MARK XII. 38—40.	LUKE XX. 46, 47.
Βλεπετε απο των	Προσεχετε απο των
γραμματεων, των θελοντων	γραμματεων, των θελοντων
εν στολαις περιπατειν,	περιπατειν εν στολαις,
και ασπασμους	και φιλουντων ασπασμους
εν ταις αγοραις,	εν ταις αγοραις,
και πρωτοκαθεδριας εν	και πρωτοκαθεδριας εν
ταις συναγωγαις, και	ταις συναγωγαις, και
πρωτοκλισιας εν τοις δει-	πρωτοκλισιας εν τοις δει-
πνοις·	πνοις·
οἱ κατεσθιοντες τας οικιας	οἱ κατεσθιουσι τας οικιας
των χηρων, και προφασει	των χηρων, και προφασει
μακρα	μακρα
προσευχομενοι, οὐτοι λη-	προσευχονται, οὐτοι λη-
ψονται	ψονται
περισσοτερον κριμα.	περισσοτερον κριμα.

"Here it is seen, that the latter end of St. Mark's sentence, grammatically speaking, forgets the beginning; *των θελοντων*, in the first clause, requiring to be followed up by *των κατεσθιοντων* and

προσευχομενων in the last clauses. Accordingly St. Luke, who deviates but very little from St. Mark throughout the whole passage, does deviate from him in this, and corrects the syntax in a manner the most natural and easy, writing οἱ κατεσθιουσι and προσευχονται—

Mark viii. 36.	Luke ix. 25.
και ζημιωθη την ψυχην αυτου.	εαυτον δε απολεσας, η ζημιωθεις.
xii. 20.	xx. 28.
ουκ αφηκε σπερμα.	απεθανεν ατεκνως.

" In these, and in other instances which might be mentioned, St. Luke shows himself anxious to avoid the Hebraisms of his predecessor. Moreover, in the arrangement of his facts it is found, that St. Luke agrees with St. Mark in a manner which could not be accidental, and which differs from St. Matthew.

" But as years rolled on after the ascension of our Lord, the church waxed more and more gentile in its members; and agreeably to this, whilst, as before, by internal evidence we determine St. Luke to have written after St. Mark, by internal evidence we determine him to have written chiefly, if not altogether, for a Gentile community. Thus, whilst St. Matthew traces up the genealogy of our Lord to David, St. Luke goes on to Adam; the one being the Evangelist of the Jews, the other of all mankind. St. Luke marks the date of the Saviour's birth and of John's preaching by the reigns of Roman emperors; he speaks with peculiar accuracy and frequency of the ejection

of unclean spirits, the gods of the heathens; he purposely waives an appeal to the Jewish law, where another Evangelist has introduced it, (compare Luke vi. 31, and Matth. vii. 12; Luke xi. 42, and Matth. xxiii. 23;) he sinks in his narrative circumstances which would have no interest for the Gentiles; St. Matthew, for instance, tells us, that Jesus predicted the fall of Jerusalem, 'as he sat upon the Mount of Olives.' xxiv. 3, 4; St. Mark, 'as he sat over against the Temple,' xiii. 3,4; whereas St. Luke gives the prophecy, and with that contents himself, xxi. 7, 8. He adapts his phraseology to Gentile conceptions, and whilst St. Matthew much more frequently talks of what Moses *said*, or of 'that which was *spoken* unto you by God,' forms perfectly understood by the Jews, as implying quotations from the Old Testament, St. Luke, though not renouncing the former expression, favours rather what is *written* in the law, what is '*written* in the book;' a distinction which we may observe well exemplified on one occasion in the language of St. Paul, for to Felix the *Roman* governor he speaks of himself as 'believing all things which are *written* in the law and the prophets,' Acts xxiv. 14; to king Agrippa, 'a man expert in all customs and questions which were among the *Jews*,' as 'saying none other things than those which the Prophets and Moses *did say* should come,' Acts xxvi. 22. He explains what to Jews, or to those who held much intercourse with Jews, would need no explanation, 'the feast of unleavened bread, *which is called the passover*,' xxii. 1; 'a Mount, *which is called* the Mount of Olives,' xxi. 37; 'Capernaum, *a city of the*

Jews, iv. 31 ; 'Nazareth, a *city of Galilee*,' i. 26 ; 'Arimathea, a *city of the Jews*,' xxiii. 51 : 'the country of the Gardarenes, *which is over against Galilee*,' viii. 26 ; 'Emmaus, *which was from Jerusalem about threescore furlongs*,' (σταδιους εξηκοντα,) xxiv. 13. He gives *Greek* the precedence, 'in letters of Greek, and Latin, and Hebrew ;' whereas St. John (who is the only one of the Evangelists besides that here enumerates the languages) says, 'in *Hebrew*, and Greek, and Latin.'

"Of St. John's Gospel it may not be thought necessary to speak so much at large. It has very little in common with the other Evangelists, but is composed with a very manifest reference to them. He takes for granted that incidents which they have related are known ; and makes no mention of the circumstances of Christ's birth, baptism, temptation, or transfiguration ; none of the call of the Apostles, or of their names ; none of the institution of the Lord's Supper ; many of the most important particulars of the trial and crucifixion he omits, whilst, on the other hand, many of a secondary importance he details in a manner to show that he was thoroughly familiar with all : the miracles he does not dwell upon ; of five only he speaks at length, feeling that the world was already in possession of authentic accounts of them. In some instances, the allusion to his predecessors is marked : he tells us, that as Jesus returned home from Jerusalem through Judea, he tarried to baptise, and that John also was sojourning at Œnon near to Salem for the same purpose ; 'for John,' it is added, 'was not as yet cast into prison,' iii. 22 : but who had said a word respect-

ing any imprisonment of John? not the Evangelist who records this; he well knew, however, that others had spoken of it, and therefore he introduces this remark to obviate any possible objection that his narrative was inconsistent with theirs. Again, in speaking of Martha and Mary, xi. 1, he breaks off, and, in a parenthesis, observes, 'it was that Mary who anointed the Lord with ointment and wiped his feet with her hair;' yet he had not communicated a syllable about this transaction in any previous passage, though others, he was aware, had. St. John therefore clearly considers himself as furnishing a supplement to the well-known labours of those who had already occupied the same field,—a supplement which the heresies of the times (for already had the mystery of iniquity begun to work) rendered necessary. Now the appearance of such divisions in the Church indicates Christianity to have been then of a certain standing, and coincides very singularly with several incidental expressions in this Gospel which argue its late date. Thus St. John, in speaking of the Passover, calls it 'the Passover *of the Jews*,' to distinguish it, no doubt, from the Christian Passover, which it should seem was then of consideration enough to require some distinction in the terms, ii. 13. So, the lake which St. Matthew and St. Mark call the 'Sea of Galilee,' St. John calls the 'Sea of Tiberias,' vi. 1., xxi. 1; the new name derived from the town which Herod the Tetrarch had built in honour of Tiberius having by this time superseded the use of the old one.—'This spake he, signifying by what death he (Peter) should

glorify God,' xxi. 19, is another passage to our present purpose; for it carries along with it evidence that it was written after the martyrdom of St. Peter, and he was an old man when he suffered, v. 18. Moreover, the comment which St. John makes upon an expression of Christ relating to his own end, leads to the same conclusion: 'Yet Jesus said not unto him, he shall not die; but, if I will that he tarry *till I come*, what is that to thee?' xxi. 22. Here, whilst he denies that Jesus said he should not die, he admits that he said he should live till *he* came; and this distinction he takes as though it would be felt to vindicate the good faith of his master, and correct the mistake of the brethren. And how?—It does it by the figure aposiopesis. St. John is conscious that the 'coming of Christ' was then acknowledged to be the destruction of Jerusalem, which had already fallen out when he wrote, and which therefore, according to the prophecy, he had lived to see.

"Thus do we find in this Gospel, as in the others, internal evidence of its truth, arising out of a coincidence between its date, which is discovered to be late, and the condition of the church at the time, which is discovered to be heretical. We are well aware that this scheme has its difficulties (indeed no solution of the phenomena presented by a comparison of the diction and matter of the four Gospels, which has yet been attempted, is without difficulties); they are in general, however, such as appear to us rather of a negative than of a positive character, resting not so much upon our knowledge as upon our want of it;—

that if, for instance, successive Evangelists had made use of their predecessors' writings, we might expect to discover the principle by which they regulated themselves in the use; nevertheless that this we cannot always do; that sometimes it seems to be on the principle of an epitome, sometimes of a supplement, sometimes again of neither one nor other, but to be a matter, humanly speaking, of mere arbitrary choice. Still we do not throw up a theory which has so much to plead for it, in despair, because we cannot, even with its help, unravel the thousand motives, little and great, which determined men who wrote near eighteen hundred years ago, to this line or that, in every instance. Neither shall we stay to discuss how the original language in which St. Matthew composed (Aramaic or Greek) bears upon this question, nor how the preface of St. Luke; either of them matters which do bear upon it, no doubt, though not in a manner, as far as we can perceive, hostile or, at least, fatal to Dr. Townson's theory. But one objection which has been advanced against this scheme, and all others of its kind, is too specious to be passed over in silence.

"It is said that we have proved too much; that in thus accounting for the resemblances among the several Evangelists we injure them as independent witnesses. This, however, we deny; and we are the more solicitous to make the grounds of our denial good, because here, undoubtedly, is the weak part of Dr. Townson's Essay. That they successively wrote their Gospels, each his own, without any knowledge of the previous history of the other, and yet fell into whole pages of

almost verbal agreement, is an untenable opinion; nothing less than a continued miracle, such as that conveyed in the exploded tale of the writers of the Septuagint, being enough to explain such a phænomenon; unless indeed we have recourse to an original document from which they all drew, a supposition which makes more knots than it unties. But the same scrutiny into the Evangelists, which determines that they did not shut their eyes to one another's labours, determines, too, that each wrote from a knowledge of his own, notwithstanding. The variations of the several Gospels; the matter introduced into one or other above the rest; the explanations occasionally annexed; above all, the undesigned coincidences which may be detected on a comparison of them with one another, or with writers nearly contemporary,—sufficiently testify that though the witnesses have been admitted to converse together, and have availed themselves of their intercourse, they will still bear cross-examination and confronting, because each has a separate knowledge of the facts he attests, and is not the mere echo of his companion.

"St. Matthew we may let pass; he was a principal in the events he relates, and his narrative gives ample proof of it. But what have we to say of St. Mark? Whether this Evangelist was indebted to St. Peter for his information, as history directly asserts, and as his Gospel incidentally confirms, or to any other source, certain it is that his writings betray, by many minute particulars, the eye-witness: 'the pillow in the hinder part of the ship,' on which Jesus was asleep,

iv. 38; 'the *green* grass' on which the multitude sat down, vi. 39; the 'rising of blind Bartimeus, and the casting away of his garments,' when our Lord met him, x. 50; the 'ruler of the synagogue, Jairus by name,' instead of the indefinite 'certain ruler' of St. Matthew, v. 22; the exception of 'one loaf' which the disciples had with them, viii. 14, where St. Matthew states generally that they had forgot to take bread, xvi. 5; 'the colt tied by the door without, in a place where two roads met,' xi. 4; the peculiar crime for which Barabbas was in prison, where St. Matthew contents himself with describing him as 'a notable prisoner,' xv. 7; the quality of Joseph of Arimathea as an 'honourable counsellor,' whom St. Matthew designates merely as a 'rich man,' xv. 43—45; the occasional preservation of the precise words uttered by our Lord, such as 'Talitha kumi', 'Ephphatha', v. 41, and vii. 34; in these, and in other instances of a similar kind, there is a liveliness of description that determines the writer or his informant to have been also the spectator.

"In like manner St. Luke, who, whether from St. Paul or from personal observation, or both, 'had perfect knowledge of all things from the very first,' gives token enough that his acquaintance with the circumstances of our Saviour's history was intimate and independent: the minute particulars of the conduct of Martha and Mary at the village feast, x. 38, 42; the sudden exclamation of the woman in the company who had heard Jesus speak, xi. 27; the news incidentally brought to him of the murder of the Galileans, and the

immediate reflection our Lord makes upon it, xiii. 1; the small stature of Zaccheus, and the expedient to which he had recourse in consequence, xix. 3; the number of swords among the attendants of Jesus, xxii. 38; the rebuke which one of the thieves cast in the other's teeth, xxiii. 32; the broiled fish and honey-comb which were offered to Jesus after the resurrection, xxiv. 42; these are all particulars of a class and character which bespeak the narrator's possession both of accurate and original information. The same may be predicated of St. John, and be still more easily proved. But this is not all.

"The *independence* of the Evangelists as witnesses of the facts they attest, is further apparent from points of casual agreement, the very nature of which must satisfy the most suspicious critic that it does not and cannot come of collusion amongst the parties: the incidents on which the observation is founded are such as surprise us, by the artless manner in which they lock into one another, like the parts and counterparts of a cloven tally. St. Matthew, for instance, introduces us to a scene which represents 'James, the son of Zebedee, and John, his brother, in a ship with Zebedee, their father, *mending their nets*,' iv. Not a word is said of any accident having happened to the nets which furnished this employment to James and John. But let us turn to the fifth chapter of St. Luke, where the events of the same place, the same day, and the same people are related, and we learn that the Lord having bade Simon let down the net, he and his companions did so, and 'they inclosed a great multitude of

fishes, and *their net brake*.' Here, therefore, the Evangelists, each telling his own tale in his own way, without any studied reference to his colleague, complete one another's narrative and confirm one another's veracity. Or again—'When *the even was come*,' says St. Matthew, viii. 16, 'they brought unto him many that were possessed of devils, and he cast out the spirits with his word, and healed all that were sick.' Now, why did they bring the sick and the possessed to Jesus when *the even was come*, and not before? Let us suppose that St. Matthew's Gospel had chanced to be the only one that had descended to us; in that case the value of these few words, 'when the even was come,' would have been quite overlooked as affording an argument for the truth of the story; nor could it have been conjectured what thought was influencing St. Matthew's mind at the moment when he let them drop. But on the other hand, let us suppose that we had been long in possession of the three other Gospels, and that this of St. Matthew had just been decyphered among the Ambrosian manuscripts; and that, on comparing this passage with the corresponding one in St. Mark, i. 21. 29, it was perceived that the latter actually assigns this influx of diseased and demoniacal persons to the transactions of 'a *Sabbath-day*, after Jesus was come out of the synagogue;' and that, on referring to another place, Luke xiv. 3, we found that it was reputed unlawful amongst the Jews to 'heal on the Sabbath-day,' and that the Sabbath was not over till 'the even was come.' After this would not a new light strike upon us, and a conviction that this

Gospel, in saying 'when *the even was come* they brought unto him all that were possessed with devils,' was telling the truth; and that truth was the more manifestly stamped upon it by the artless manner in which this fact was announced, and the entire absence of all explanation touching the day of the week, and the prejudice relating to it? We are not concerned about the perfect intelligibility of this passage in St. Matthew,—its meaning is obvious, and it would be a waste of words to offer what we have done by way of commentary; all that we have been anxious for is this, to point out the *undesigned* elucidation which one Evangelist receives from the other, and thence to infer the independence of the testimony of either. To take another case:—'At that time, says St. Matthew, 'Herod the Tetrarch heard of the fame of Jesus, and said unto his *servants*, This is John the Baptist,' xiv. 1, 2. Now St. Luke, who speaks of this same incident, ix. 7, says nothing about the servants as being the persons to whom Herod communicated his suspicions; but, in another place, he, and he only of the Evangelists, tells us of at least one servant of this same Herod having a disciple of Christ for his wife,—Joanna, the wife of Chuza, *Herod's steward*, being one of those who ministered unto him, viii. 3,—a circumstance which certainly corroborates St. Matthew's assertion that Herod communicated with his *servants* touching the character of Jesus, some of them being better informed on the subject than himself. Here there is at once a correspondence between two witnesses which argues their knowledge of one another; yet withal such facts sepa-

rately stated by either, as argue their knowledge of the matters they wrote about to be independent of one another.

" Or, to put the question of the *independence* of their testimony to another proof:—St. John mentions many incidents with regard to the crucifixion in common with the other Evangelists, and there is every reason to think (as we have already said), from the tenor of his whole Gospel, that he had seen the Gospels of his predecessors; but he, and he only, speaks of Pilate 'sitting down in the judgment-seat, in a place that was called the *Pavement* (λιθοστρωτον). Let us try this supplemental fact by another test, that of coincidence, not with any other Evangelist, but with something near contemporary history,—with Josephus. Pilate comes out of his own hall to his judgment-seat on the *Pavement*: this is St. John's assertion. The hall and the pavement were therefore, according to him, near or contiguous. Now let us turn to the Jewish historian:—'The city was strengthened by the palace in which he (Herod) dwelt, and the temple by the fortifications attached to the bastion called Antonia,' (Antiq. xv. c. viii. § 5.) Hence we conclude that the Temple was near the castle of Antonia. 'On the western side of the court (of the Temple) were four gates, one looking to the *palace*,' (Antiq. xv. c. xi. § 5.) Hence we conclude that the temple was near the *palace* of Herod; therefore it follows that the palace was near the castle of Antonia. But if Pilate's hall was a part of this palace, as it was, (for there, Philo tells us, what indeed we might have guessed, was the residence of the Roman governor

when he was at Jerusalem,) then Pilate's hall was near the castle of Antonia. Here let us pause a moment and direct our attention to a passage in the Jewish War, vi. c. i. § 8, where Josephus records the prowess of a centurion in the Roman army, Julianus by name, in an assault upon Jerusalem.

" 'This man had posted himself near Titus, at the Castle of Antonia, when observing that the Romans were giving way, and defending themselves but indifferently, he rushed forward and drove back the victorious Jews to the corner of the inner Temple, single-handed,--for the whole multitude fled before him, scarce believing such strength and spirit to belong to a mortal,—but he, dashing through the crowd, smote them on every side, as many as he could lay hands upon. It was a sight which struck Cæsar with astonishment, and seemed terrific to all. But his fate overtook him, as how could it be otherwise, unless he had been more than man,—for having many sharp nails in his shoes, after the soldiers' fashion, he slipped as he was running upon the *Pavement* (κατα λιθοστρωτου) and fell upon his back; the clatter of his arms causing the fugitives to turn about. And now a cry was set up by the Romans in the castle of *Antonia*, who were in alarm for the man.'

" From this passage it seems that *a pavement* was near the castle of Antonia; but we have already seen that the castle of Antonia was near Pilate's hall, therefore this pavement was near Pilate's hall. This then is proved from Josephus, though very circuitously, which is not the worse, that

very near Pilate's residence a pavement (λιθοστρωτος) there was; that it gave its name to that spot is not proved, yet nothing can be more probable than that it did; and consequently, nothing more probable than that St. John is speaking with truth and accuracy, when he makes Pilate bring Jesus forth and sit down in his judgment-seat in a place called the Pavement. Thus does the narrative of St. John, in this particular, stand the trial we proposed.

"It would be most easy to multiply instances of this kind, the last of which is taken from Professor Hug's Introduction to the Writings of the New Testament, a work which has supplied us with several other hints already embodied in this article; and which though not free from very serious objection, must be allowed to contain a vast deal of curious and interesting matter. Enough, however, has been advanced to show the nature of Dr. Townson's argument, and the value of it; and that if we admit certain appearances in the Gospels to be inexplicable, perhaps, without some communication amongst their several authors, there are other appearances no less inexplicable without an independent knowledge of their subject on the part of each.

"Now, whilst this theory accounts in a great degree both for the resemblances and differences of the Evangelists, it seems to leave the question of inspiration untouched. In the *prophetical* parts of Scripture, it is clear to demonstration, that the Spirit of God supplied to successive individuals an intimate knowledge of his will with respect to *future events;* yet those individuals availed them-

selves of the writings of their predecessors notwithstanding; and we see no greater reason for doubting the inspiration of the Evangelists because they did so, than for doubting the inspiraration of Isaiah because he sometimes adopts the language of David; or that of Jeremiah, because he does the same by Isaiah. Nor in the principle of *accommodation* (where there is no compromise) do we find any stumbling-block in our way. The gift of tongues was doubtless a *spiritual* gift; but once imparted, it was as much subject to the discretion of the parties in the application of it, as if it had been learned by grammar and dictionary; and accordingly, by some it was used, and by some (as we read) it was abused: it was used when the speaker *accommodated* his language to the audience he addressed; when he spoke Greek to the Grecian, and Arabic to the Arabian;—and it was abused when he addressed the latter in the language of Greece, and the former in that of Arabia, not caring, through vain glory, though he should be a barbarian to them, and they barbarians to him. In like manner the spirit influenced the *matter* which the Apostle delivered, as he influenced his *language*; but he did not in this case, any more than in the other, suspend the exercise of his own common sense, which would naturally dictate an *accommodation* (not a compromise) of that matter to the character and wants of those to whom he submitted it; nor in a Gospel, for instance, meant exclusively for Gentile converts, insist upon his dwelling emphatically upon Jewish privilege (however strong expressions to that effect might have been recorded with perfect truth,

as having fallen from the lips of our Lord); nor in a Gospel meant for Jews, require him to omit the correctives specially administered to Jewish corruption. In all these instances, 'the spirits of the Prophets,' as St. Paul expressly tells us, 'were subject to the Prophets.'—1 Cor. xiv. 32.

"Meanwhile this cannot fail to strike us, that in the case of the Apostles, both in their *hearts* and in their *understandings*, (the two provinces for the operation of the Spirit of God,) we observe them presenting a very singular contrast to themselves, when contemplated before the Crucifixion, and shortly after it;—such a contrast as requires to be accounted for, and does coincide in a very remarkable manner with the supposition that an extraordinary illapse of the Holy Spirit had occurred to them in the interval, which enabled them to brave dangers from which they had before shrunk, and to understand scriptures to which their eyes had been before blinded. This same Spirit, therefore, it is reasonable to believe, did not desert them in the composition of those writings which they have left us, but guided them into all truth.

"The precise mode, indeed, in which the Spirit influenced the holy men of old, we do not pretend to determine; in this, as in almost any other investigation, it is an extremely easy matter to puzzle ourselves, or for others to puzzle us, if we will go far enough,—if we will not 'know to know no more.' A special pleader may confound a perfectly veracious witness, but the jury sees the man all the while to be a true man; and, without troubling themselves to unite the hairs which the other has split, accepts the testimony and forgets

the logic. The precise mode in which inspiration directed the Apostles may be unintelligible; so is the precise mode in which instinct directs the swallow. The poor bird, however, does not meanwhile set himself down on the house-top and argue himself into a distrust of the principle, whatever it is, till winter cuts off his speculations and his life together; but prunes his wing, and commits himself to its guidance, nothing doubting, and finds it land him at last, tempest-tost perhaps, on a soil where his foot can rest, and in a clime where he can bathe himself in the genial breeze."

THE END.

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